A CHILTON PUBLICATION

the Iron Age

NATIONAL METALWORKING WEEKLY

August 6, 1953

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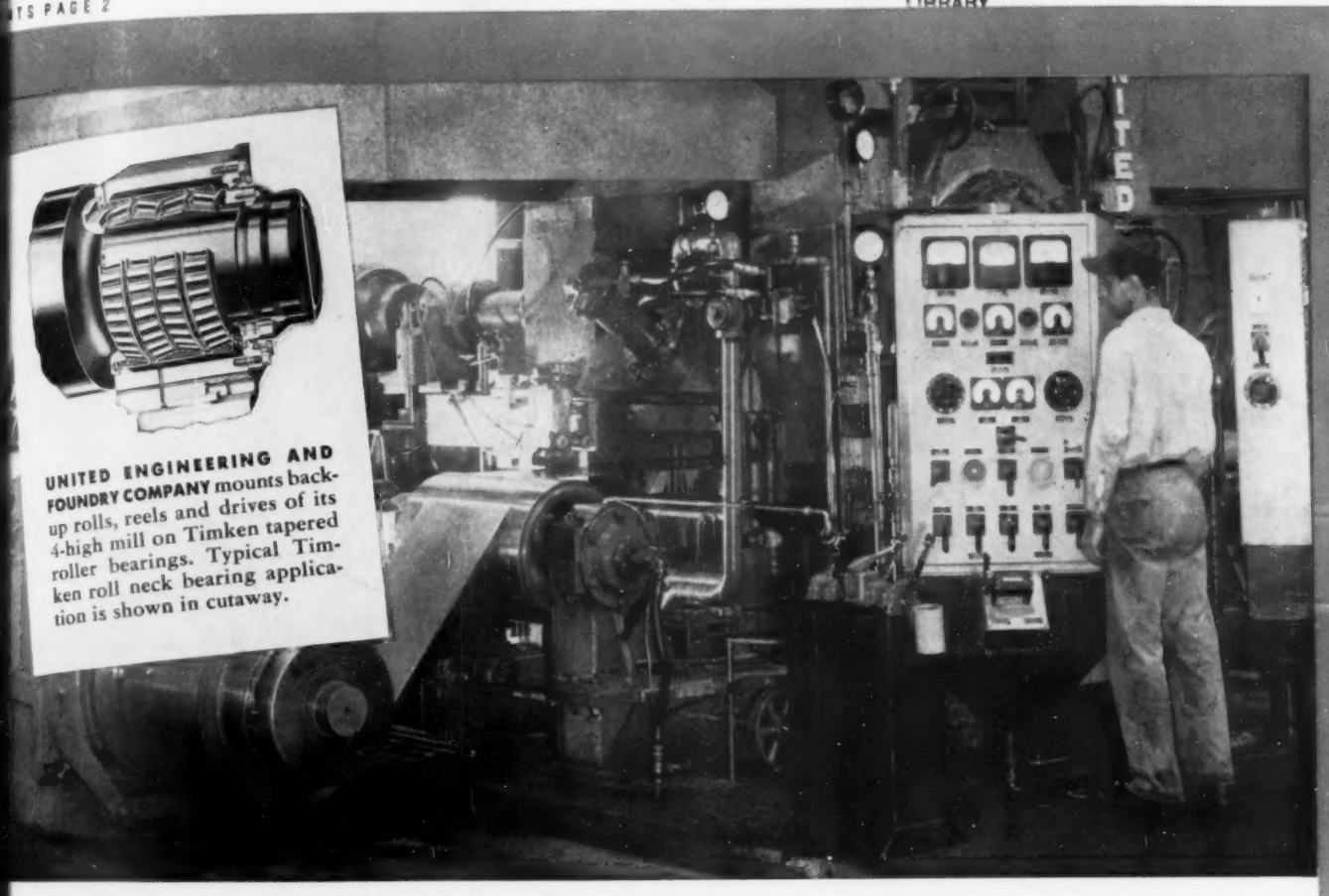


UNITED ENGINEERING AND FOUNDRY COMPANY mounts back-up rolls, reels and drives of its 4-high mill on Timken tapered roller bearings. Typical Timken roll neck bearing application is shown in cutaway.

Rolls out maximum tonnage at minimum bearing cost with TIMKEN® bearings on back-up rolls

ACTUAL cost figures show that Timken® bearing equipped mills—like this 6″ x 35″ x 30″ 4-high mill built by United Engineering and Foundry Company for Allegheny-Ludlum—operate at minimum bearing cost per ton of steel rolled! That's the big reason for using Timken bearings on back-up rolls. And in the mill shown in the picture, Timken bearings are used in the reels and drives, too!

It's been proved that mills operating on Timken bearings have less downtime for maintenance and repair. Timken bearings eliminate complicated lubrication systems. Simple, economical grease lubrication is all that's needed. Roll changes can be made quickly and easily, because there's no elaborate system of pipes and tubing to unhook.

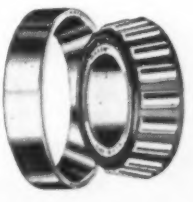
The tapered construction of Timken bearings enables them to take *any* combination of radial and thrust loads. No need for auxiliary bearings to take thrust loads.

Years of research and development by the Timken Company have resulted in many improvements in roll neck bearing design and performance. For more information about Timken roller bearing applications, write The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

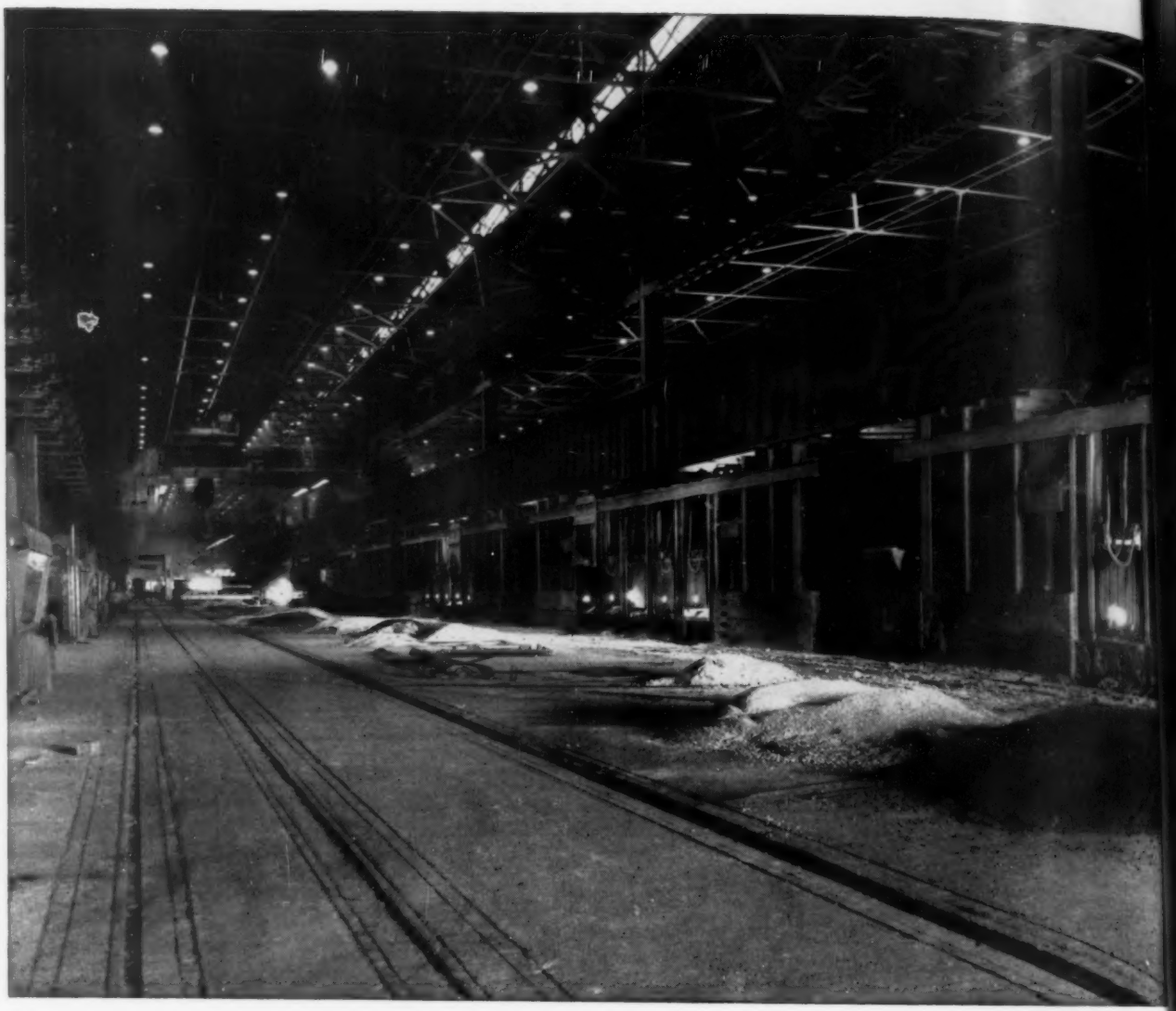
TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ⊡ AND THRUST →⊡← LOADS OR ANY COMBINATION



Ramset bottoms* installed in new open hearths at Youngstown's Indiana Harbor Works

YOUNGSTOWN Sheet and Tube is making steel on Ramset bottoms in its new open hearth shop at the Indiana Harbor Works.

A majority of the bottoms installed in new open hearth shops in the past several years are of rammed construction—and of these hearths, Ramset installations hold a 2 to 1 advantage over any other magnesia ramming mix.

Basic Refractories pioneered the development of rammed hearth methods nearly fifteen years ago. These methods have been continually refined over the intervening years by the practical steelmakers who make up Basic's sales and service staff. A few years ago, Basic supplemented this advanced technique by making available mixing, conveying and compacting equipment specifically designed for the job.

So, in selecting Ramset, a steelmaker avails himself of a proven refractory and the most modern methods and equipment for installing it, as well as of the services of Basic personnel who, by background and training, are skilled in the use of granular basic refractories.

*Surfaced with grain magnesite

Basic Refractories Incorporated 845 HANNA BUILDING, CLEVELAND 15, OHIO

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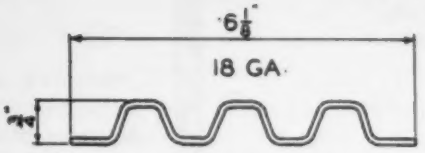

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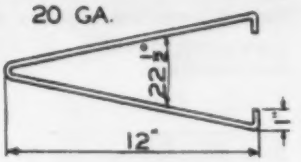

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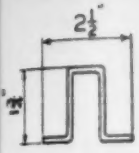

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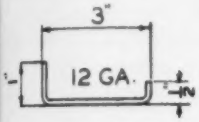

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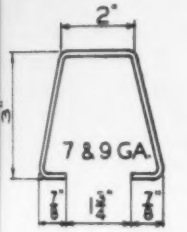

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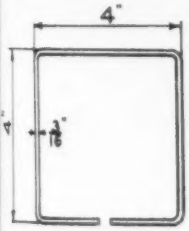

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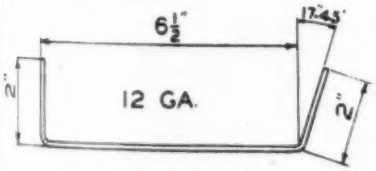

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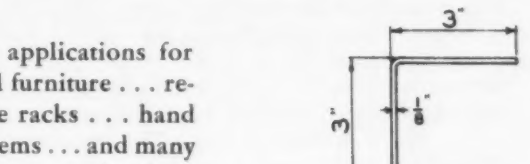
There are dozens of product applications for Mayari R cold-formed shapes . . . metal furniture . . . refrigerators . . . door tracks . . . storage racks . . . hand rails . . . curtain tracks . . . conveyor systems . . . and many others that will occur to you when you study these drawings.

These shapes are formed or rolled to the exact dimensions you require, without any waste material. They are easy to cut and assemble. And they can be welded by the usual methods used for carbon steel.

Mayari R, our low-alloy, high-strength steel, has a yield point of 50,000 psi minimum, almost twice that of plain carbon steel. This means that lighter gages can be used to reduce deadweight without sacrificing strength. Mayari R also has from 5 to 6 times as much resistance to atmospheric corrosion as plain carbon steel, and 2 to 4 times that of copper-bearing steel.

Consider these made-to-order sections with the thought of improving the design of your products, reducing deadweight, or cutting production costs. We'll be glad to help you work out a shape that will meet your needs. Get in touch with any Bethlehem sales office, or write to us at Bethlehem, Pa.

BETHLEHEM STEEL



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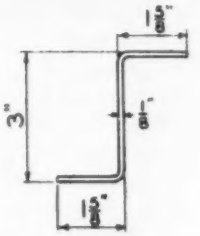

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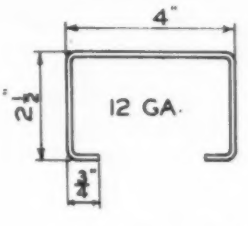

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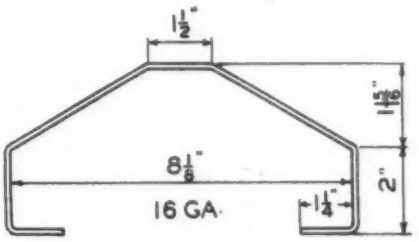

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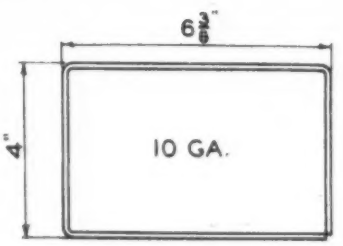

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BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mayari R *makes it lighter... stronger... longer lasting*

The Iron Age

Vol. 172, No. 6, August 6, 1953

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NEWS DEVELOPMENTS

ARMISTICE, CUTBACKS CAUSE LITTLE CHANGE—P. 71
Survey by The Iron Age of major industrial centers indicates most companies are taking the armistice and approved defense spending cutbacks in stride. No indication that any major expansion plans will be dropped. Though allotted less than $35 billion, Defense Dept. will actually have $43 billion to spend next year.

YOUR TAX RATE WILL BE LOWER NEXT YEAR — P. 77
Scheduled cuts in federal tax rates, unaffected by congressional tax law wrangles, will save both individuals and corporations money in 1954. Business is to pay about $2 billion less. Individual income taxes will be cut about 10 pct. In addition, excise tax reductions will save consumers about $1 billion.

NEW INDUSTRY SEEKS OUT CLEVELAND AREA—P. 82
Cleveland, often called the "best location in the nation," has attracted $1.5 billion in industrial expansion since V-J Day. Steel, metalworking and ore form the industrial backbone of the area, but high diversification of production is a Cleveland hallmark. Civic boosting has played a big role in the area's growth.

READING RACKS SPREAD MANAGEMENT'S WORD—P. 83
More than 1500 companies have found that informative, interesting booklets placed in plant reading racks are a vital aid in informing employees. Some companies put out own material but trend is toward use of commercial services. Booklets cover many fields, cost little and have high readership.

DETROIT DOMINATES SCRAP GENERATION TOO—P. 90
Largest single consumer of steel, the automotive industry is also the nation's biggest producer of scrap. It is estimated automakers offer more than 100,000 tons of scrap for sale each month. Most of it is premium quality and commands top prices, several dollars above the market price for dealer scrap.

KOREAN TRUCE REACTION WILL BE GRADUAL — P. 95
The Korean truce will have little immediate effect on industry, according to present Defense Dept. thinking. The Armed Forces are anxious to stretch out contract cancellations, aid industry in a smooth transition to civilian production. Draft calls will dip this fall but a rise is scheduled in mid-1954.

the Week in Metalworking

ENGINEERING & PRODUCTION

LIQUID COUPLING AIDS ULTRASONIC TESTING—P. 131
Liquid searching unit combines the advantages of contact and immersion test methods. Crystal wear is practically eliminated and rough surfaces can be uniformly inspected. Results are comparable to immersion method without immersing work. Defects ⅛ in. below surface in aluminum are detected.

GLASS LAMINATED PLASTICS SPEED TOOLING—P. 136
Glass cloth-and-resin laminate-coated cast iron welding and assembly fixtures will be used by a major auto producer for 1954 models. They are cast undersize and built up with nonshrink laminate to the required contour. No machining is required. Fixtures are lightweight and strong.

SETUPS, SPRAY LUBRICATION BOOST OUTPUT—P. 140
Production is up and tool costs down as a result of new setups for turning steering knuckles at the Studebaker Corp. Copying lathes replaced automatic lathes with multiple tooling. Cutting tools are solid triangular carbide. Spray mist lubrication is used. Oil is smokeless and odorless.

MILL SPEEDS ROLLING OF THIN COPPER STRIP—P. 143
Better dimensional uniformity and improved soundness of rolled stock have resulted from use of a new reversing cold strip mill at the Chase Brass plant in Cleveland. Using a Sendzimir 23-25, reductions of 90 to 95 pct in copper strip rolled to 0.0025 in. are obtained.

DOUBLE-MELTED TITANIUM FOR HOMOGENEITY—P. 146
Pressed and sintered sponge electrodes have been discarded. Initial ingot is now forged into rod which serves as an electrode in a second melting operation. Hardness increases 10 to 30 Bhn, but homogeneity is greatly improved. Ingots weighing up to 200 lb may soon be produced in pilot plant.

NEXT WEEK—BREAKAGE CUT WITH COATED STEELS
Greater economies are ahead for producers of deep drawings and stampings. With factory-applied zinc and phosphate coatings, designers of parts made by press will be able to make more complicated stampings and use more severe draws. Tests have shown a large decrease in breakage.

MARKETS & PRICES

GAMBLE $85 MILLION ON STAINLESS GROWTH—P. 74
Allegheny Ludlum, confident of continued growth in demand, is spending $85 million to expand its stainless steel capacity. Use has doubled every decade since it was introduced in the '20's. Defense curbs hurt civilian demand, but the firm is sure of a huge pent-up demand. New uses, grades are being developed.

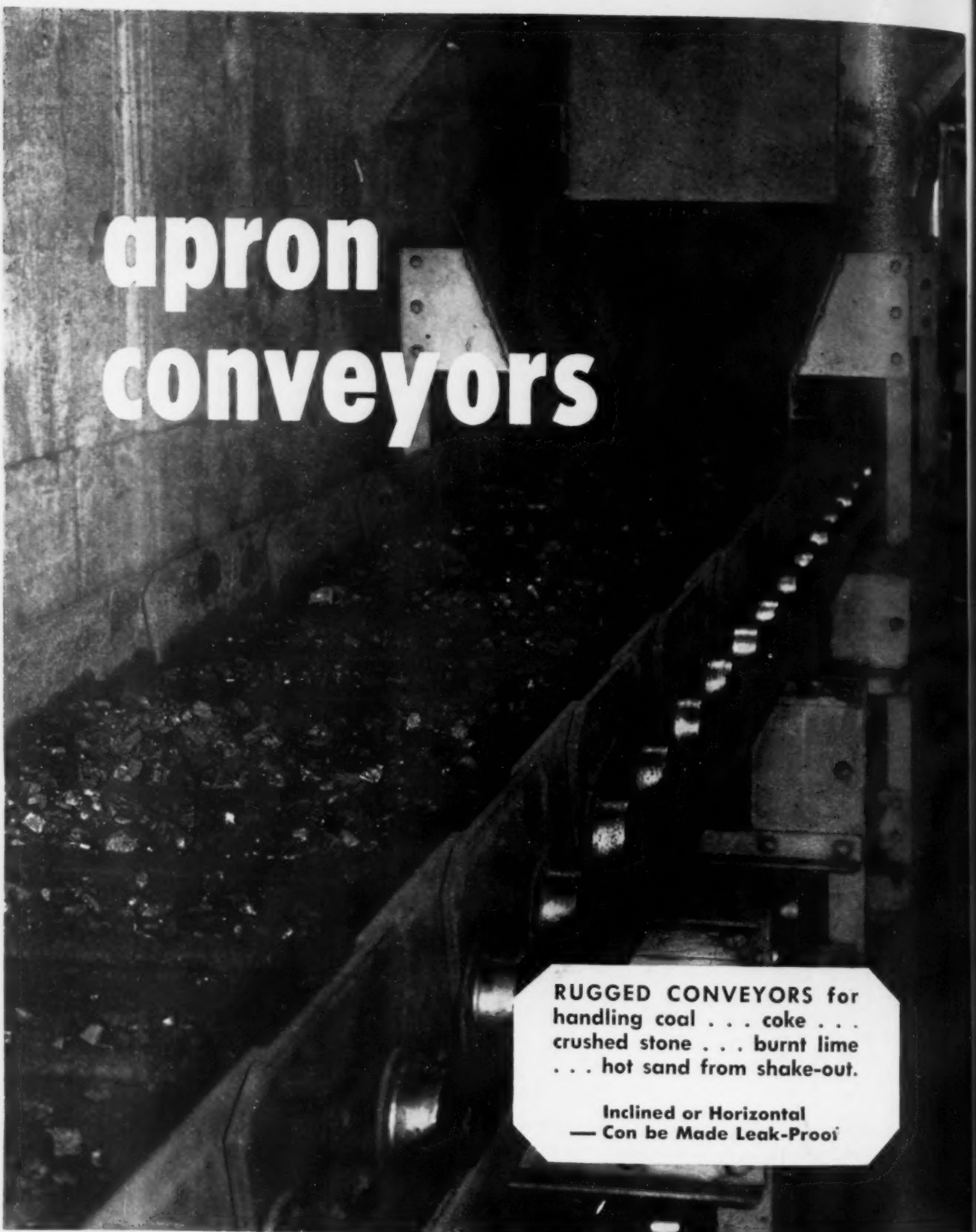
STEEL'S SECOND QUARTER EARNINGS CLIMB — P. 78
Propelled by expanded production capacity and demand, steel industry second quarter earnings for the bulk of the industry climbed 7.42 pct over first quarter. First half 1953 profits were also substantially over first half last year but the '52 steel strike should be considered here. Labor peace is helping now.

ALUMINUM HITS NAIL MARKET ON THE HEAD—P. 79
Production of aluminum nails is running about 33 pct ahead of last year—and sales are outstripping this. Recent widespread acceptance for fastening asbestos siding and roofing comes on top of the "natural" capture of the market for aluminum fastening. A major producer predicts 300 pct rise in next 5 years.

TOOLMAKERS AIM FOR REPLACEMENT SALES — P. 101
The Korean truce has convinced machine tool builders that they must concentrate on the civilian replacement market. But defense orders should still be substantial. A strong sales campaign is being mapped, with particular emphasis on automakers, who traditionally have a low replacement rate. European competition a threat.

STEEL MARKET STRONG, AUTO PRESSURE EASES—P. 171
Although steel's biggest customer, the auto industry, is exerting a little less pressure, the market remains very strong. Disappointed customers wont believe supply and demand are nearing balance until they can place orders for all the tonnage they want. Detroit customers are cautious on fourth quarter ordering.

COPPER, BRASS MARKETS SOFTEN, PRICES DOWN—P. 174
Copper and brass markets turned sticky last week. Soft ingot demand and good scrap supplies were reflected in lower prices by ingot makers and custom smelters. Because of uncertainty custom smelters stayed out of the scrap market. Conditions were further stirred up by Chile's labor mess.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National Business Publications

Goodby Citizen Taft

ROBERT A. TAFT was more than Mr. Republican. He defied classification but he came closer to being Mr. American.

Bob Taft was in tune with those who founded this country and with those who today try to keep the aims of the founders. In a sense he was unpredictable.

Those who attempt to obtain all the facts cannot always be consistent. As Bob Taft found new facts and broader experiences he often abruptly changed his views. He confounded those who place superficial labels on people and their thinking.

Where his country was concerned Bob Taft rose above party. That's why some Republicans feared him and others were unsure of him. His honesty and integrity often disturbed those who lacked the mind or will to act as he did.

It took a rare man like Bob Taft to say simply what millions of Americans thought about our country and U. N. on the Korean problem. His "go it alone" statement lacked the political "nicety" so common today in American diplomacy.

Robert Taft was perfectly human. He did appear unpredictable and inconsistent. Small men—and big men—feared his rugged honesty. He favored government help to underprivileged, underhoused and undereducated Americans too poor to help themselves. Yet he was the greatest supporter of free enterprise in the land.

He did not compromise with truth and broad vision as he saw them. He was a plain and simple citizen and not so complex and unfathomable as some would have us believe. He was true to himself and to what he believed.

He will go down as the gamest loser of all times. His support of President Eisenhower after being defeated in his life's ambition was classic—but just what one would expect from Robert Taft.

His unstinting—and unpublicized—help and advice to people of all religions was just another sign of the man.

Goodby Citizen Taft. We need more like you.

Tom Campbell

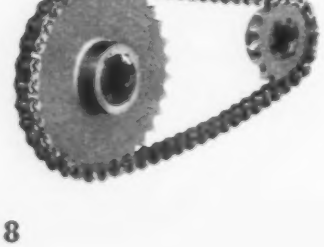
Editor

Link-Belt roller chain sprockets with taper lock bushings

HERE'S great news for users of roller chain drives! With the new Link-Belt taper lock sprocket, you don't have to fit the sprocket to the shaft. These sprockets with their taper lock bushings give you the equivalent of a shrink-fit on all standard shaft sizes.

Installation and removal are fast, simple. Set screws force and hold bushing in tapered bore of sprocket, *clamp* it tightly onto shaft. The *full length* of the bushing supports the sprocket on the shaft. Turning set screws in removal holes quickly releases it from shaft.

What's more, it's no longer necessary to wait while wheels are rebored. You can pick these sprockets right off the shelf at your nearby Link-Belt distributor or factory branch store. Available now are sizes for ½, ⅝, ¾, 1 and 1¼-in., single-width chains with other sizes to be announced. Ask for Bulletin 2449.



AN IDEAL COMBINATION:
LINK-BELT PRECISION STEEL ROLLER CHAIN & LINK-BELT SPROCKETS

LINK-BELT

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Dear Editor:

Letters from readers

Steel Price Increase

Sir:

I don't know what your attitude has been about the untimely and ill-judged price increases which have been made by the great industrialists since April 30th, because I don't see all of your issues. I have put the proposition direct to the heads of several big companies, but they will not play at all. They will give me no reason for these increases. Here are the reasons against price increases as one small free enterprise sees them:

First, all business people have been looking forward to a clear, bright change of climate under the administration we have. The Government is really doing something to combat inflation, yet some companies . . . pitch in promptly with price increases. Can big companies find signs of demand to warrant these increases?

Second, it looks like big companies gave the unions a fine send-off on their chase for another round of substantial wage increases. Before their labor negotiations came to a real pinch, they raised their prices. Didn't this say to the union leaders—"Here it is, boys, right on the platter, come and get it"?

Third, did they make these increases because they anticipated dropping of the excess profit tax? Whether or not this was the motive, the public will think so, and this action will aggravate the union leaders.

Fourth, the Administration has very definitely improved the climate for private power and the central station industries; yet before they can think about getting one foot off the ground in the way of new enterprises, these big companies take a slap at them and increase prices on important components of central station costs.

With a due sense of our lowly position in the industry, but with an abiding remembrance of the fine old rule—The minority is just as apt to be right as the majority—I asked them—why?

What are your comments on these price increases if you have not made any so far?

W. J. MANN, JR.
President
The Wolfe & Mann Mfg. Co.
Baltimore, Md.

As usual, we are in the middle of this problem and both sides seem to have unkind things to say about us. We have covered this thing pretty closely in an editorial and more closely in the news section. Our news coverage included a complete research story on the changes. We recently ran a story indicating how much the steel base price increases and the steel extra increases would cost steel users.—Ed.

Tool Steel Directory

Sir:

URGENTLY NEED PURCHASE ORDER 185334 COVERING TOOL STEEL DIRECTORIES.

C. W. VORDENBERGE
Electric Auto-Lite Co.
Lockland, Ohio

Copies of the 1953 edition of "The Iron Age Directory of Tool Steels and Carbides" are off the press and orders are now being shipped. (Price of the new edition is unchanged at $2.00 a copy.)—Ed.

Glossary of Terms

Sir:

In your issue of June 4th, you refer to copies of the "Glossary of Terms Used in Methods, Time Study and Wage Incentives" published by the Society for Advancement of Management. We would appreciate it if you could send a copy of this to us.

W. F. NEWBURY
Manager
Kelsey-Hayes Co.
Dagenham, Essex, England

Sorry we don't have any copies of the "Glossary of Terms." They may be obtained from the Society for the Advancement of Management, 74 Fifth Ave., New York 16, N. Y. for $1.00.—Ed.

Reprint Permission

Sir:

The editorial "Vice-President in Charge of Souls" in your March 5th issue has just come to our attention. May we have your permission to reprint this in our publication with proper credit?

MARIE PFEIFER
The Living Church
Milwaukee, Wis.

We are glad to give you permission to reprint in "The Living Church."—Ed.

Silver Paste

Sir:

In your July 9th issue on the Newsfront page there is an item regarding soldering on ceramics which is being done by applying a silver paste to the ceramic material. Will you please tell us what company supplies this silver paste?

A. W. HOLMES
Director of Research
Indiana Steel & Wire Co.
Muncie, Ind.

The supplier of the silver paste is E. I. Du Pont De Nemours & Co., Nemours Building, Wilmington 98, Del.—Ed.

Polystyrene Sheet

Sir:

We would like to get the name and address of the manufacturer of the new Polystyrene Sheet containing rubber which was described on the "Newsfront" page of your July 16th issue.

D. D. WENDT
Bemis Bros. Bag Co.
Minneapolis, Minn.

The Chicago Molded Products Co., 1048 N. Kolmar Ave., Chicago 51, Illinois is the manufacturer of this new plastic sheet.—Ed.

The fact that *so many* manufacturers find there are Pheoll stock fasteners that meet exact needs—makes Pheoll stocks the ***one source*** for you to depend on, too. Our wide range of sizes, metals and finishes simplifies assembly problems; speeds production—because fasteners that fit, make jobs go faster!

Pheoll rolled threads and cold formed heads provide maximum structural strength to meet stress and strain. Snug thread mating surfaces assure greater contact with more lasting grip—adding life and service to your assembled products.

The extra fine head and thread finish of Pheoll quality fasteners improves the salability of your product. They help "dress up" the job! You can select from a wide variety of attractive head types in screws for metal, wood and plastics—nuts with single or double chamfer in various metals and finishes.

Write for Additional Information and Price List.

MAKE PHEOLL YOUR SOURCE FOR: Semst • Thread Cutting Screws† • Threaded Rods • Wood Screws† • Machine Bolts • Cap Screws • Stove Bolts† • Thumb Screws • Machine Screws†

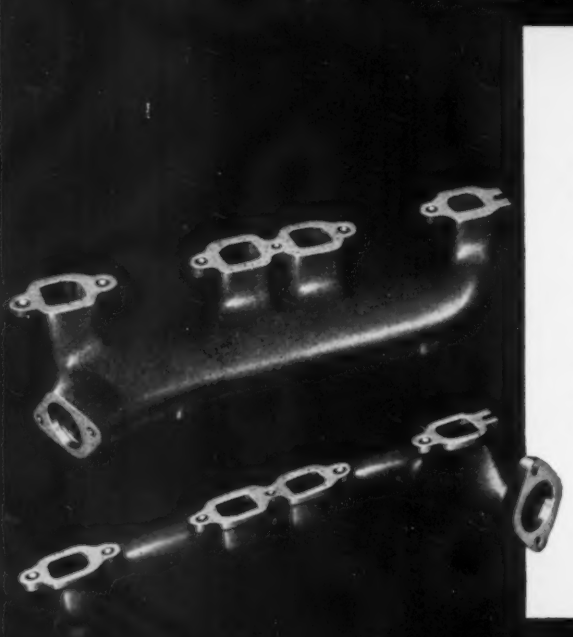
†Furnished in slotted and Phillips Recessed Head Types

PHEOLL MANUFACTURING COMPANY — SCREWS BOLTS NUTS

For More Facts Circle MF-366 on Reader-Service Card

Another Transfer-matic by Cross

Completely Machines Exhaust Manifolds



- ★ Machines right and left exhaust manifolds completely — 42 milling, drilling, boring, chamfering, and tapping operations.
- ★ 230 pieces (115 right and 115 left) per hour at 100% efficiency.
- ★ Ten stations—one loading, one unloading, three milling, three drilling, one boring, one tapping.
- ★ Palletized work holding fixtures with power wrenches for automatic operation.
- ★ Cross-Drive for milling cutters.
- ★ Other features: Built-in chip conveyor and automatic removal of chips from fixtures after each cycle, pre-set tools, J.I.C. standard construction, automatic lubrication, hardened and ground ways.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

Fatigue Cracks

by William M. Coffey

Inside Iron Age

Here begins another new department, poor, picked-on reader, which concerns itself with what makes your favorite family journal, *i.e.* ffj, tick. To be "inside" things these days seems to be the place to be. What good it will do for you to be inside THE IRON AGE we little know, but we do have a purpose, yes, a purpose.

Today the lesson will be drawn from inside the Circulation Department, and a more brilliantly efficient, hard-working crew never existed, nor a place where it would be better to be outside of. We will first draw a parallel. Just as a bank issues statements each month, so, too, does the Circulation Department issue an audited Publisher's Statement every six months.

This statement gives the complete picture of what our circulation consists of in numbers of people and companies that subscribe and in what these people and companies do. It breaks down the circulation by states, by types of manufacturing companies, by the titles or positions of individual subscribers — general managers, vice-presidents, presidents, purchasing agents, engineers, etc.

It thus contains essential information that advertisers must have in order to judge THE IRON AGE as a suitable market place for their wares, *i.e.* products, *i.e.* things like ball bearings, machines, tools and things. Now these statements can be good or bad, just like magazines can be good or bad.

This here advertiser when he looks at our statement wants to see the kind of companies listed that can be sold his product and the kind of people listed who are in a position to influence its purchase. A fellow selling ball bearings doesn't want to see a bunch of Congo natives cluttering up the statement, *i.e.* unless the Congo natives are buying ball bearings this year.

We have a good statement, *i.e.* with few Congo natives, and the ones we do have are using ball bearings. Another reason we have a good statement is because it shows our Renewal Percentage to be around 80 pct, which is a very high mark of distinction, indeed. This means that 80 pct of our subscribers think so much of the superb editorial content of THE IRON AGE that they take it *again*.

We previously stated that we had a purpose in bringing you inside the CD. We wish to keep our renewal percentage where it belongs and you, as a subscriber, can accomplish wonders towards this end. So please renew your subscription. Then everybody will be happy—the boss, the advertiser, yourself and the little Ovaltines can keep drinking their beer. NEXT WEEK: Inside Nutley, N. J.

Tool Steel Directory

We will now leave the Circulation Department and move inside the Brains (*i.e.* Editorial) Department, one of whose responsibilities is getting out the 1953 edition of the ever-popular Tool Steel Directory. There was a little delay in accomplishing this feat, but we have just received shipment from the printers and copies are being rushed to all of you who so patiently waited and suffered through our delaying tactics.

We know, however, that you will find this new, 1953 edition worth the delay. It is much more conveniently arranged than the '52 and it contains a lot more information. The new SAE classification system is used. Since most of the tool steels fit this classification it means you get all sorts of additional data on these steels, from physicals and chemistry through heat treating and forging temperatures, heat treating mediums, steps to prevent decarburization, etc. It is now really a heat treating guide plus a tool steel directory, plus another thing —full descriptions of all major carbides (123) of the major carbide producers (10). What more could you get for $2.00?

Warning! Those who have not yet sent their order, do so at once! Last year's edition proved so useful it sold out in a few months and literally thousands of people were disappointed. This year, advance orders have already put a tremendous dent in our supply. So vite, vite (*i.e.* get crackin').

Puzzlers

As winners of the car puzzler we last week left out Miss Eileen McGeeny, Giuseppe Scott and Regi Stollstorff, H. R. Boyer, Mr. Montgomery Ward, Kenneth Roth and Mr. Rice.

How many cows at $10 each, pigs at $3 each and chickens at 50¢ each can a man buy with $100?

let's talk turkey

about a prime source for

CUSTOM ALUMINUM EXTRUSIONS and ROLL FORMED SHAPES

The R. D. Werner Company may be your ideal supplier because...

We're big enough

to handle the largest job. We have the know-how and the most modern production equipment in the world for producing custom aluminum extrusions and roll formed shapes... also T4, T6 heat treating equipment.

We're small enough

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We're alert enough

to meet delivery dates promptly realizing that SERVICE is part of our job. It's one *big* reason why our customer list grows every day.

Try us and see if you don't like the way we serve you—phone MU 6-2595 to discuss your particular requirements... or write

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Werner ALUMINUM

Custom Extrusion and Roll Forming
Aluminum or Stainless Steel

ease and economy

...with Super Service accuracy

● *Photo—Courtesy Aerojet—Division of The General Tire & Rubber Co.*

Working on rocket motors at Aerojet—Division of The General Tire & Rubber Company, this versatile 4′ 9″ column Cincinnati Bickford Super Service Radial is economically drilling and tapping in type 347 stainless steel.

Class 3 fit is required on the tapping operations of these ½″ x 20″ and 7/16″ x 24″ holes.

In this unusual installation a 12-foot pit permits processing of large work in vertical position, while another piece is set up on large V-block fixtures on plain box table.

The centralized controls clear view Bickford Head, and wide selection of speeds and feeds all bring ease and economy on this job.

Write for Booklet R-21-B.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio U.S.A.

TRUCE: Industry Sees No Sudden Change

IRON AGE survey shows industry is taking armistice, defense cutbacks in stride . . . No expansion cuts expected . . . Military has $43 billion to spend—*By A. K. Rannells.*

Governmental and industrial reaction to (1) signing of the Korean truce and (2) military budget reductions indicates this country has made up its mind not to be talked into a depression—or even a recession.

With the eager U. S. Commerce Dept. and the more conservative Federal Reserve Board as bellwethers, most Federal agencies believe that neither development will have much effect on business.

Commerce Dept. places its faith on present high rates of production, employment, wages, capacity, buying power, and similar factors. On the other hand, Federal Reserve Board is guided by actual surveys of the man on the street.

Latest consumer quiz was taken when the truce and budget cuts were definitely expected. It reveals that while potential buyers were shopping around for the best offers, there was no expressed intention of retrenchment in purchases of homes, durables, or other major consumer goods.

Warned in Advance

This optimism is shared by industry in general. Spot checks this week by THE IRON AGE indicate little or no industrial excitement as a result of last week's developments.

Final approval of defense spending cutbacks brought no wringing of hands within metalworking industries. Reason is that the major cutbacks have already been announced and industry anticipated the necessary adjustments. Even small manufacturers have recently been shying away from volume contracts, whenever possible.

Most industry officials contacted were quick to point out that proper handling of reductions in defense orders merely permits an orderly switch to normal civilian production and selling.

Continue Expansion

Budget reductions, they say, should lead to reduced taxes and greater latitude for both business and personal expenditures.

Commerce Dept. said last week that surveys indicate a continued high rate of capital outlay. This is supported by THE IRON AGE'S check. No evidence was found of any major intention to retrench on planned expansion programs.

In Cleveland, for example, business has more than $100 million worth of expansion plans in the works, but so far no one admits any intention of shelving blueprints.

Reaction in Detroit, which could easily be the first sector to feel the major effect of further defense cutbacks, is typical of most industrial centers.

Major industrial facilities in the area have taken it on the chin already, having absorbed a lot of cutbacks without serious effect, though they still face considerable adjustment.

$10 Billion for Procurement

But the region expects to weather these difficulties. Automotive officials, facing production gaps that won't readily be filled, have contended all along that heavy defense spending isn't necessary to maintain a strong production rate and economy.

But behind official optimism, there is still a lot of concern. Smaller businesses in particular are won-

What Are Business Prospects Now

Consumers:
Will not retrench on purchases of homes, durables, other goods.

Industry:
Expects to compensate for a large share of defense cuts with increased production, sales of civilian products.

Expansion:
No talk of scrapping major projects at present.

Small Business:
Will have considerable time to adjust to changes in economy.

Defense Spending:
Though allotted only $34.4 billion, Defense Dept. will actually have $43 billion to spend during the next year.

Aircraft:
Military will set aside nearly $26 billion to buy planes.

Military Hardware:
Army will have about $15 billion to spend on weapons, tanks, handling equipment, construction, other items.

Personnel

FOOD: Farm Out Plant Cafeterias

Industry increasingly using food service firms to run plant cafeterias . . . Save time, money, trouble . . . Improve food quality, sales . . . Plan small plant service—By K. W. Bennett.

An industrial worker, like Napoleon's troopers, can travel further and do more on a properly filled stomach. An increasing number of firms find their employee relations as much a stomach ache as a head ache. They are re-examining the problem of in-plant feeding, employing professional food management firms to operate their plant cafeterias.

Serves 19 Plants

To the harassed manufacturer struggling whenever he can spare the time to manage a plant cafeteria, these firms offer to purchase his food, see that it is skillfully prepared, and keep his employees' diet sound. In addition, they do the necessary bookkeeping, reduce operating costs in a department that too often has been a consistent drain on company funds.

An excellent example of how professional plant cafeteria management works is offered by Cooper Industrial Food Service, Inc., of Chicago. Described as a medium sized firm in a field that already boasts "40 to 50 good sized businesses," Cooper manages from a central headquarters the operation of 19 industrial plant cafeterias in the Chicago area.

Using Cooper, Inc., as an example, the results seem impressive. The 19 company-owned, Cooper-operated cafeterias are in plants employing as many as 3500 persons and as few as 500. To Cooper, 500 employees is the breakeven point, and at present it is uneconomic to take over cafeteria operation in firms having fewer employees.

But plans are in the offing to enable industrial food service to operate in plants with as few as 100-200 employees.

Cut Cafeteria Costs

One concern had been operating a plant cafeteria for 30 years at annual costs as high as $140,000. This was reduced, under the industrial food service management sys-

Special Report

Continued

dering if they can exist without a heavy volume of defense contracts, but it appears they too will have a considerable period for adjustment. Major cutbacks have already been announced. Reductions in the current military budget won't be felt until late next year.

As finally legislated, the Defense Dept. is to get nearly $35 billion in new money, of which a substantial portion must go for operations and housekeeping. But nearly $10 billion is definitely earmarked for major procurement.

Defense Dept. estimates that the actual pay-out between now and next July 1—including delivery of production now on order and for which money was previously voted—will run more than $43 billion.

Have $20 Billion in Orders

Pentagon experts figure spending might drop as much as $1 billion below this estimate, if the Korean hostilities are really at an end. But even this reduction leaves a sizable defense allotment to oil the wheels of industry.

Even the aircraft industry is in good shape. Since Korea, roughly 21,000 planes have been ordered and nearly $30 billion has been set aside to pay for them on delivery.

Delivery rate is now running close to 650 a month and will only rise to about 730 a month by next spring when it will level off at that point. This means that less than $10 billion has actually been paid out, leaving $20 billion worth of orders in various stages of production.

Adding unobligated funds ($2.5 billion) to a new money appropriation of $3.5 billion, the total outlay for plane production during the next few years rises to approximately $26 billion. And the Air Force will order 1400 additional aircraft this year.

"She has everything. Beauty, intelligence, and a father who is half owner of a tube mill."

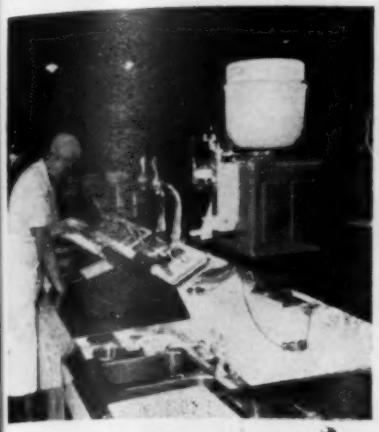
The Army is in much the same situation. It has orders on the books for about $12 billion worth of "basic military hardware" which includes weapons, tanks and other mobile equipment and vehicles, bridging, construction, and materials handling equipment.

Congress voted an additional $3.5 billion for this sort of buying, bringing available funds to well over $15 billion.

Actual expenditure is estimated at about $5 billion during fiscal '54 and the rate will probably drop to about $900 million per quarter by late spring. This will leave $10 billion on the books to keep plants going after next July 1.

Final legislative pruning resulted in reducing the amount for starting the Vance Plan for stockpiling critical capital equipment to $250 million instead of the $500 million requested.

This was not regarded as a serious blow to defense programming. Defense Secretary Wilson told Congress earlier that it was unlikely that more than $200 million would be obligated, regardless of whether the full amount was appropriated.



SODA FOUNTAIN bar installed at Ekco Products Co., Chicago, by Cooper Industrial Service.

tem, to an annual outlay of $80,000 to $90,000 per year, including the fee paid the food management firm. At the same time, employee use of the cafeteria increased by 20 pct.

A second firm, which had been doing $120 worth of business in its plant cafeteria daily, increased attendance to the point where $240 worth of business was being done daily, with costs decreasing. Another plant has increased use of the cafeteria by company employees by 300 pct under the management service plan, again has reduced costs.

How It Works

Briefly, industrial food service firms operate as follows:

(1) An advisory team visits the subscribing plant, looks over existing facilities, recommends any changes in cafeteria equipment they think necessary. They will design a cafeteria layout where none exists.

(2) An estimated operating budget is made up for the subscribing plant. Thus far, Cooper's estimates on costs, while generally lower than previous costs for food in the plant, have been further reduced by the service when it got into full operation.

(3) A team of dietitian and chef-manager set up the initial operation. This includes training personnel, menu planning, supervision of meal service. Books are set up, and a cost control system introduced.

(4) A resident chef-manager takes over the cafeteria. Even the appearance of food on the tables is taken into consideration, for the greatest eye appeal.

Plant management and Cooper, Inc., receive daily reports on food costs and labor costs. Each week the resident chef-manager sends Cooper his food requirements for the week following. Cooper buys the food, and since the menus are standardized though tasty, the firm buys food for 19 cafeterias for delivery the week following.

Why They Like It

The plant owner supplies the cafeteria facilities and labor. Cooper, Inc., supplies the chef-manager, purchasing, accounting, employee training, and food preparation knowhow. Executives of plants now farming out the operation of their cafeterias in this manner generally list four reasons:

First: economy. Centralized buying and careful daily cost control and auditing seem to do the job.

Second, in nearly every case employee relations have been aided. One firm found renovations in the old plant cafeteria would cost $2000, put it up to the employees if they prefer that the $2000 spent on the annual company picnic be spent on the cafeteria. They agreed and the cafeteria is now regarded as a model installation.

Better, Cheaper Food

(Renovations generally cost well over $2000, however, and this is a very low figure. At least one company installed a brand new cafeteria at a cost of $50,000 which will take quite a spell for amortization in the form of cost savings).

And third, most companies agree that the food gets better. While any number of companies are operating their own cafeterias and doing a bang-up job, executives and desk men who complained at the food in some of the old cafeterias are again happy under the food service management system at the plant.

Fourth, running a company cafeteria can be a considerable headache to company management.

DISHING OUT the food at Ekco Co.

Major cost item in the Cooper plan is the initial renovation of the existing cafeteria by the subscribing manufacturer. Beyond that, the plan has shown, in the Midwest, good results in cost reduction, turnover reduction, morale boosting, and in bringing the white collar crew back to the company dining room.

Raw Materials

Ore:

Inland Steel's ore boat modernization program ended.

A three-year program of repowering and lengthening ore boats of the Inland Steel Co. fleet was completed last week with the fleet's annual carrying capacity increased 135,000 tons since the program was launched.

Last of the fleet to complete its alterations, the *Philip D. Block* headed for the upper Great Lakes on its first run of the season after about nine months in dry dock.

It joined four other Inland ore boats, plus others leased from Lakes shipping firms, which have been bringing ore and limestone into Indiana Harbor, Ind., at a pace approaching the record shipping of 1951.

Repowering the *Block* with new 4500-hp steam turbine engines and boilers, as well as new pumps, generators and auxiliary engines, will give the vessel a 20 pct increase in speed, a cut of about 15 hours for a round trip.

STAINLESS: Bet On Bigger Markets

Allegheny Ludlum bets $85 million expansion on continued growth of stainless demand . . . Flat-rolled items hottest in market . . . Develop new grades, uses—By W. V. Packard.

Allegheny Ludlum Steel Corp. is betting $85 million on the future market for stainless and alloy steels. The market had better be good.

In view of some pessimistic forecasts of general steel demand this looks like a pretty risky bet by the country's biggest stainless producer. But when you take a closer look at the facts it doesn't look like such a big gamble at all.

Market Can Double

In the first place, stainless steel is one of the fastest growing segments of the steel industry. Its use in this country has doubled in every decade since it was introduced commercially around 1920.

And, despite its emergence as a tonnage product, Allegheny Ludlum people who have studied the stainless market believe that it can double again in the 1950's.

Flat-Rolled Hottest

President Ed Hanley candidly admits "we've been behind our market on capacity every year (except 1949) since before the war."

The present expansion program should take care of that. Along with its expansion of other product capacities the firm is practically doubling its capacity to produce flat-rolled stainless.

Growth of demand has been fastest in these items and they continue to be the hottest part of the market. Stainless accounts for about half of the company's sales.

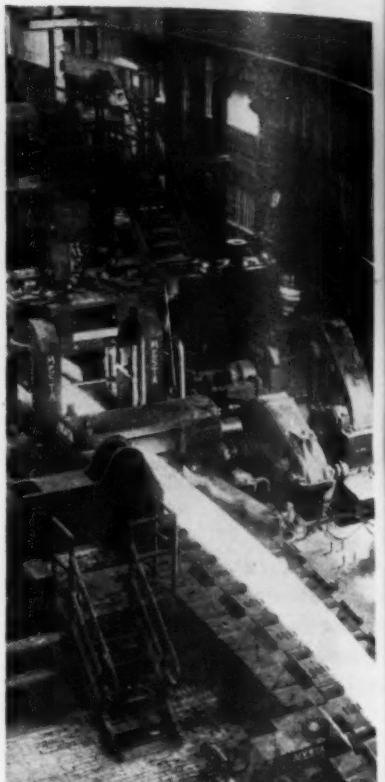
Keeps On Growing

History of stainless growth is one of ever-broadening applications. Years of painstaking cooperation between users and producers were the foundation of that growth. In the late '20's two things happened to give it a big boost:

First, a process was discovered for melting scrap, which until then had been a total loss. This permitted production of a stainless grade at lower cost, so it could be used much more widely.

Second, stainless was adopted for use on radiators of Ford cars. thus planting it squarely in the automotive field. Automotive trim now accounts for the biggest use of stainless strip.

Remarkable war growth of stainless was converted to civilian applications with hardly a pause for breath. The same thing is expected to follow the Korean War. R. M. Allen, vice-president, sales, forecasts: "Even with our great and costly expansion we'll have inadequate capacity in 5 years."



VITAL PART of stainless expansion is this high powered 56-in. hot strip mill.

Still Need Salesmen

But before that happens the burden will be on the sales department to employ the costly new capacity as fully as possible. Demand is still strong, but buyers are no longer hammering on sales office doors to place orders.

Sales officials admit they face some relocation of business. And in some current applications they are more or less at the mercy of designers. But they are supremely confident people will continue to want more of the bright metal.

Sales Development Mgr. R. A. Lincoln believes there is a terrific pent-up demand for stainless that will be felt when and if sufficient nickel becomes available. He says: "Best proof of demand is eagerness of customers to get substitute stainless grades when old favorites are not available."

STAINLESS STEEL SHIPMENTS

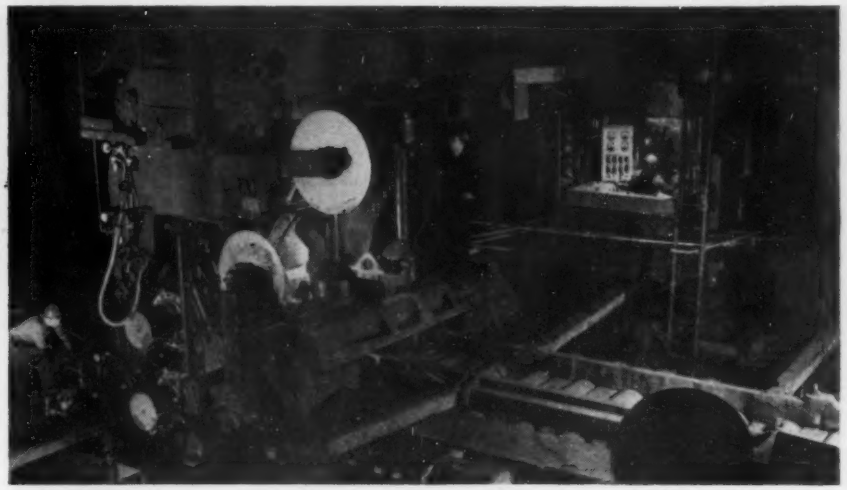
Finished and Semifinished Products, Net Tons

PRODUCTS	1952		1951		1950		1949	
	Shipments	Pct of Total	Shipments	Pct of Total	Shipments	Pct of Total	Shipments	Pct of Total
Ingots	33,541	5.3	19,321	3.6	16,904	3.8	16,292	6.1
Blooms, Billets, Slabs, etc.	88,320	13.9	18,367	3.3	10,405	2.3		
Plates	29,038	4.4	18,127	3.3	12,098	2.7	8,670	3.2
Sheets—Hot Rolled	38,883	6.1	38,585	7.5	27,428	6.1	15,515	5.8
Sheets—Cold Rolled	108,347	17.1	108,063	20.0	109,279	24.3	54,780	20.5
Strip—Hot Rolled	20,433	3.2	8,076	1.5	7,750	1.7	5,741	2.2
Strip—Cold Rolled	152,623	24.0	191,290	35.5	171,968	38.3	105,072	39.3
Bars—Hot Rolled	48,934	7.7	42,938	7.8	28,598	6.4	19,652	7.3
Bars—Cold Finished	51,522	8.1	41,732	7.7	30,848	6.9	17,928	6.7
Pipes and Tubes	24,161	3.8	16,457	3.1	11,308	2.5	7,336	2.7
Wire Rods	7,565	1.2	4,981	0.9	1,526	0.3	361	0.1
Wire Drawn	32,497	5.1	31,473	5.8	21,048	4.7	15,898	5.9
All Other (Incl. Shapes)	114	0.2	100	0.0	222	0.05	634	0.2
Total	634,978	100.0	539,510	100.0	449,380	100.0	267,677	100.0

Source: American Iron & Steel Institute

* First half 1953 production of stainless and heat resisting steels was 594,203 net tons.

DEEP DRAWING is possible (above) with chrome-manganese steel, third stainless family.



NEW universal roughing mill readies slab for passage through finishing stands.

Since he works closely with customers, Dr. Lincoln knows a lot about their plans for stainless use. He can cite examples of successful substitution of straight chrome grades in place of chrome-nickel grades — some to the extent of amazing the experts.

In Market Again

But emergency restrictions have curbed the peacetime march of stainless use. For example, in 1950 Allegheny Ludlum had moved solidly into the construction market with stainless curtain walls for building exteriors. But the company had to slow down on promotion of stainless for this use after the shooting started in Korea. They are after this market again.

Still in the dream stage is a future building erected entirely of stainless steel and glass.

Develop New Grades

You hear plenty of talk that continued shortage of nickel will bar stainless expansion. Don't bet on it. Some believe nickel prospects are brighter than they've been for a long time (THE IRON AGE, July 2, 1953, p. 79). But industry isn't counting on it. Also, good austenitic stainless steels can be made with much less nickel than is required in 18-8 types (THE IRON AGE, May 14, 1953, p. 129).

This is where Allegheny Ludlum is set to shine. Its metallurgists had done considerable development work with chrome-manganese (low nickel) steels before Korea. They have produced good austenitic stainless with less than 1 pct nickel but they know a better one can be made with slightly more nickel.

Dr. Lincoln believes that after nickel restrictions are lifted a popular new stainless of the chrome, manganese, nickel family may emerge. Since this would have only half the nickel content of 18-8, twice as much stainless could be made with existing nickel supplies.

Who Uses It

It is evident that a new family of chrome-manganese stainless steels will soon take its place beside the old standbys — straight chrome (400 series) and chrome-nickel (300 series).

If approved by Washington, a heat of this will be melted in September and sent to 12 customers who will try it out.

"It's an experimental car . . . a trifle underslung."

Though stainless is still priced and sold by the pound, some of the biggest customers now use up to 1000 tons per month. Other big uses in addition to auto trim are dairy equipment, railroad cars, truck trailers, cooking utensils, chemical equipment, instruments, and, of course, jet planes.

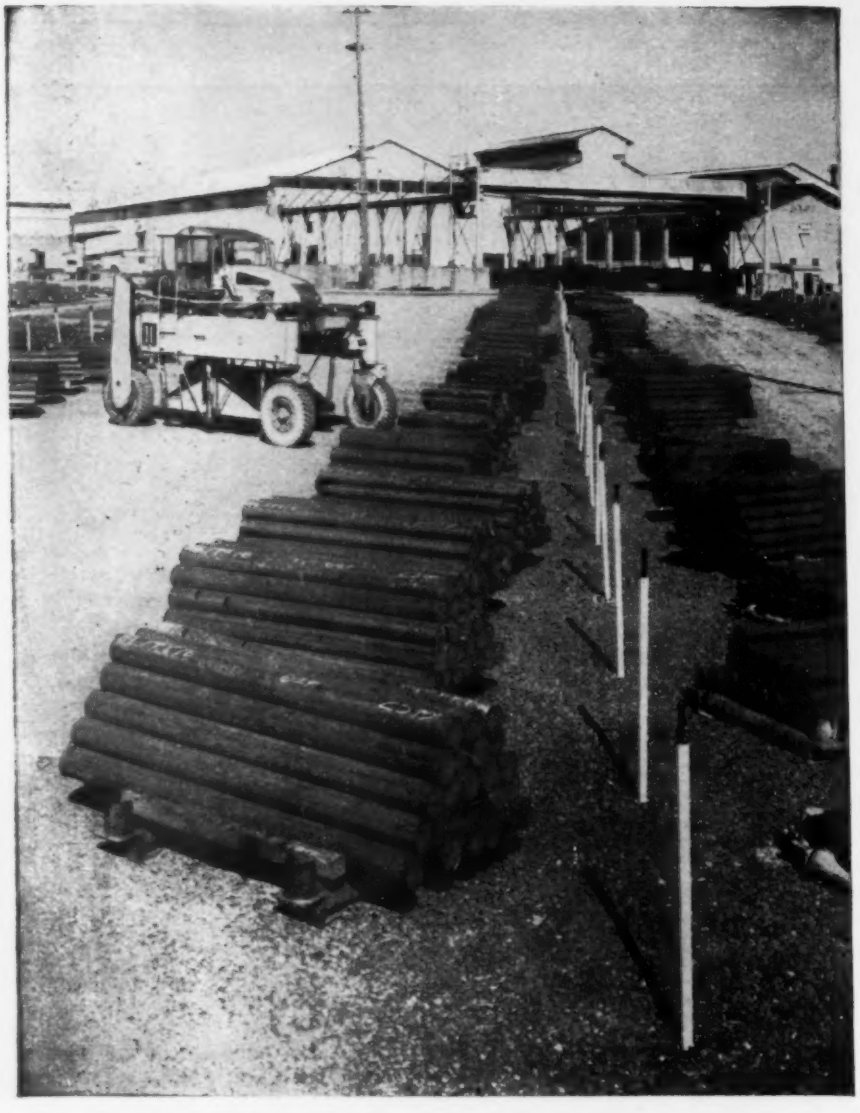
Defense has been taking less than 15 pct of production, so civilian applications haven't been lagging.

Alan Wood Plans New Cold Mill

Alan Wood Steel Co. plans to have a new cold strip mill in production by first quarter 1955. Contract for the mill has not yet been awarded but it will be either a 26 or a 27-in. 4-stand tandem mill with initial rated annual capacity of 120,000 tons. With auxiliary equipment the cost will be about $6 million. It will work with the 30-in. hot strip mill at Ivy Rock, Pa., (near Philadelphia) which the company started up in 1950.

Work Nearly Complete

United Engineers & Constructors, Inc., Philadelphia, will be in charge of construction. Work is nearly completed on a continuous strip pickling line and a new 35-in. blooming mill at Ivy Rock. Work is also under way on modernization of the company's 84-in. plate mill, scheduled for completion in mid-1954. These latter facilities will represent an additional cost of $6.5 million.



THIS PICTURE TELLS A STORY of a new cost-cutting opportunity for steel mills

Note the ready accessibility of each item of steel in this storage yard of a well-known steel mill. It's this availability of materials that's one of the prime advantages of the ROSS STRADDLE CARRIER handling method . . an advantage, unmatched by any other method, that eliminates delays, lowers costs and increases the production efficiency of the mill.

ROSS STRADDLE CARRIERS, heart of the Ross unit-load handling system, are built to handle 45,000-pound concentrated loads on around-the-clock schedules in the roughest, toughest steel mill service . . . to put those loads *where* wanted *when* wanted.

Your mill, too, can profit by this modern, flexible mass handling system. Get in touch with Ross today for the complete details.

Rely On ROSS

THE ROSS CARRIER COMPANY

Direct Factory Branches and Dealers Throughout the World

425 MILLER ST., BENTON HARBOR, MICH., U.S.A.

Employment:

Since Korea, nonfarm employment has risen by 5 million.

Since the outbreak of the Korean War in June, 1950, more than 5 million workers have been added to nonfarm payrolls. This increase is the largest recorded for any three-year period since the all-out mobilization of World War II, reports Dept. of Labor.

Practically all of the nonfarm employment jump since Korea occurred before 1953, as employment this year has just about leveled off, except for seasonal changes.

Though total number of workers rose 300,000 between May and June to swell the labor force to 49.4 million, this increase was due to seasonal changes.

Machinery manufacturing plants reported small cuts in employment for the third consecutive month. This drop, though amounting to only 2 pct between March and June of this year, is a reversal of the almost uninterrupted uptrend that has been maintained in this industry since the start of the Korean War.

Metalworkers Rise Most

Comparison of industry's distribution of nonfarm workers in mid-1953 with mid-1950 shows the increased importance of durable goods manufacturing. These industries added more than 12 million workers during the three-year period and on a percentage basis of total employment rose from 18 pct to 21 pct.

Greatest increase in the durable goods field was made by primary metal industries which have added more than 144,000 workers in the last three years. Next in line were transportation equipment manufacturers who put 252,700 more workers in their plants.

In line with President Eisenhower's campaign promise to streamline government operations, the number of federal employees continued to decline. Total of government workers now number 2.25 million, 6 pct less than a year ago.

TAXES: Next Year Will Be Better

Scheduled cuts in '54 tax rates will save business about $2 billion . . . Personal income taxes to dip about 10 pct . . . Cut excise taxes about $1 billion—By *R. M. Stroupe.*

Corporations and individual wage earners should be in healthier shape, tax-wise, late next spring than they are today.

Scheduled drops in federal rates, unaffected by the tax wrangle in Congress this summer, should be worth about $2 billion a year to corporate business. Anticipated reductions in excise taxes in 1954 are expected to make another $1 billion available to the consumer.

What You Save

Individual income levies are due for a cut of about 10 pct on Dec. 31. This will mean, for the married couple with two children (four exemptions) and an income of $7500 a year, saving of almost $100. For this family, the 1953 federal tax is $974.10; the 1954 tax will be $877.

Similarly, a couple with the same number of exemptions and an income of $12,000 will pay almost precisely 10 pct less on 1954 earnings. The bill for 1953 will be $2046; that for 1954 $1836.

Bachelors Get Break

A couple with one child and $10,000 income will be tagged for $1675.80 on this year's income. Assuming the same income for 1954, the tax will be $1504.

Even the single man, with only his personal exemption, is going to get a break. On a 1953 income of $5000 he is expected to pay $911.40. In 1954, his tax on the same amount will be $818.

Cuts about half the size of those listed were proposed this year in H. R. 1, the celebrated Reed Bill. This measure, plowed under during the recent Excess-Profits Tax (EPT) controversy between the Administration and Rep. Daniel A. Reed, R., N. Y., was to take effect last June 30.

That was the date on which EPT would have died, except for successful Administration pressure to keep it going until Dec. 31. When that decision was sustained by Congress, chances of reducing the individual tax bite this year became nil.

Hurts Small Business

Not involved in the struggle over EPT were the "normal" and surtax rates on corporate income, due for a 5 pct fall on April 1. Companies will be required to figure their taxes at the old rate for that portion of the year completed before April 1.

Well before next spring, Congress may be able to come to grips with Administration recommendations concerning the entire tax structure. Treasury Dept. officials have embarked on a thoroughgoing survey of the complete setup, intent on correcting inequities and closing loopholes in current laws. Their proposals, with White House backing, should be ready for the legislators early in 1954.

Many congressmen already have their own ideas on revising the tax system. That attitude probably characterizes members of a House small business subcommittee, who have just reported on the struggle small companies are having with existing revenue laws.

New companies, especially, are described as discouraged by the rigidity of the present structure. Working to stay in the black after their initial lean years, they are—according to the report—"unable to retain sufficient earnings after taxes to finance the normal expansion for a successful operation."

Testifying earlier this year before the subcommittee, spokesmen for small business complained that the "complexity" of the tax system places a severe burden on the companies. They advocated, as one specific measure which might help, a more lenient policy regarding allowances for depreciation and amortization.

Ease Accounting Changes

In addition to congressmen, businessmen and business associations have plenty of advice on what should be done to improve the tax laws. For example, U. S. Chamber of Commerce urges that taxpayers be given the choice of deducting or capitalizing money used for research, development.

At present, the only person who may do this is one whose established accounting method has charged such costs to expense. New taxpayers, and firms which wish to change their accounting procedures, do not have this advantage, the chamber says.

According to the organization, passage of an amendment carrying out the recommendation would "result in strengthening and improving the entire economy."

Fabricated Structural Steel

Contracts, Shipments, Backlog

Estimated Net Tons

	1953	1952	Avg. 1947-50
CONTRACTS CLOSED			
June	232,441	167,492	196,725
Year to Date	1,555,318	1,256,822	1,086,365
SHIPMENTS			
June	274,587	125,486	192,851
Year to Date	1,560,470	1,360,563	1,103,515
BACKLOG	2,152,764	2,261,503	1,214,511

Source: American Institute of Steel Construction

STEEL: Earnings Rise Sharply

Bulk of industry reports second quarter net 7.4 pct higher than the first quarter . . . Extension of excess profits tax holding back some records . . . Demand holds—By G. G. Carr.

Spark-plugged by the greatest capacities in history and fueled by unprecedented demand, the steel industry continued its upward earnings climb in the second quarter of 1953. An IRON AGE tabulation of earnings of 21 steel producers accounting for bulk of total ingot capacities shows second quarter earnings to be up an average of 7.42 pct over first quarter levels.

First half 1953 earnings were also substantially above first half 1952 levels but last year's steel strike makes the detailed comparison valueless. Certainly the favorable labor climate so far this year has been an important factor in the steel industry's production and earnings achievements.

For a number of important companies, increases in extras will be reflected in a more attractive product profit picture during the second half. These extra increases came early in May, so they were effective for only a third of the first half year.

It can be assumed that the mid-June steel base price increase covered the immediate effects of the wage increase effective June 12. But before 1953 is over, cumulative effects of the wage boost may offset the price increase.

May Get Still Better

Outlook for second half 1953 appears even brighter. Steel producers minimize any post-Korea dip in demand. They point out that direct military steel requirements have never run more than 10 to 12 pct of total production since World War II. The steel masters are confident that pent-up civilian demand will easily take up any slack which might come from cutbacks in indirect military steel requirements.

Third quarter order books have been filled to overflowing and fourth quarter books are now filling up at a rate which is frankly startling to the industry's crystal ballers. Some producers have expressed a little doubt over the last month of the fourth quarter but they refuse to be worried.

Drop Needn't Hurt

As has been stressed in THE IRON AGE for some time, a slight drop in the industry's operating rate need not hurt earnings, might even improve the financial position. This proposition is supported by two major facts:

1. Even with the enormous expansion program of the past few years, the steel industry must still operate obsolete facilities.

2. Steelmaking equipment is delicate. It requires constant vigilance and thorough maintenance to keep it in top operating condition. Over-capacity operations in the past months have meant that this maintenance just could not be properly performed. Some major maintenance shutdowns have been made only when absolutely necessary—that is, in the very expensive stage.

Steelmakers are extremely optimistic about continuing high demands. They point out that even if their single largest customer, the automobile industry, were to cease operation all together, they would lose only about 20 pct of total sales. Naturally they don't expect this and would be most unhappy if it did happen.

The appliance industry is still a heavy customer though some lines are spotty. Railroad and agricultural demand is strong, and construction is staying at high levels. Only really dark cloud on the horizon is shipbuilding.

Second quarter earnings would have been even higher if it had not been for the extension of the Excess Profits Tax. This necessitated refiguring to cover the extension.

Steel Company Earnings Reported

Company	Second Quarter '53	First Quarter '53	First Half '53	First Half '52
U. S. Steel	$55,640,806	$49,375,958	$105,016,764	$65,753,134
Bethlehem	28,534,103	30,961,033	59,495,136	24,304,730
Republic Steel	14,931,475	13,779,049	28,710,524	16,262,056
Jones & Laughlin	10,721,000	54,942,000	16,363,000	4,601,000
National Steel	12,989,799	11,084,933	24,074,732	15,546,590
Youngstown Sheet & Tube	7,985,231	6,958,975	14,944,206	8,504,618
Armco Steel	8,311,488	7,767,045	16,078,533	14,565,386
Inland Steel	8,872,371	6,805,150	15,677,521	11,345,000
Colorado Fuel & Iron	5,444,368	2,177,372	7,621,741‡	5,761,965‡
Wheeling Steel	4,093,260	2,962,388	7,055,648	3,218,519
Sharon Steel	2,239,141	1,861,826	4,100,967	940,522
Crucible Steel	2,165,641	1,756,829	3,922,470	.....
Pittsburgh Steel	1,854,782	1,971,820	3,826,612	674,891
Barium Steel	1,233,431	968,644	2,202,075	1,317,723
Allegheny Ludlum	2,163,275	2,098,370	4,261,645	.....
Lukens Steel	.....	.....	3,207,126*	1,697,543*
Granite City	1,848,123	1,340,146	3,188,269	1,145,194
Detroit Steel	1,807,318	1,692,546	3,499,864	2,043,189
Alan Wood	879,971	674,347	1,554,318	786,079
Rotary Electric	789,325	728,857	1,518,182	747,410
Continental Steel	486,474	401,213	887,687	760,012
Midvale Co.	319,535	294,648	614,183	612,839
Acme Steel	1,244,690	1,309,515	2,554,205	2,129,350[a]

* Year
‡ Three-quarters Fiscal Year July 4
[a] Includes $616,190 prior year tax credit

NAILS: Aluminum Hits Market on Head

Output at record pace . . . Acceptance for fastening asbestos a major victory for aluminum . . . Producer predicts industry will triple sales in 5 years—By *R. L. Hatschek.*

Aluminum nails are in the middle of their biggest year to date with output running some 33 pct ahead of last year's record rate. And sales are outstripping production. Prediction is that records set in 1953 won't stand very long.

Tonnage before 1947 was insignificant. Aluminum Co. of America first produced small experimental batches of 17S nails about 35 years ago, but never pushed the idea. Following World War II the increasing demand for aluminum roofing gave the aluminum nail a modest boost. In 1946 Nichols Wire & Aluminum Co., headed by Frank Nichols, started to make aluminum nails.

The steel shortage of 1948 caused a sensational upsurge in aluminum nail demand—but it also led to many misapplications which gave the aluminum nail a poor reputation. The slump that followed was short and production has been climbing steadily since mid-1949.

Aluminum Grabs Market

Essentially, aluminum nails are a specialty product, competing with other nonferrous nails and galvanized steel nails. Mr. Nichols believes aluminum nails will eventually take over about 20 pct of the galvanized market. Production last year, adjusted for the nearly 3 to 1 weight difference, topped 4 pct of galvanized nail output.

In the past 2 years the aluminum nail has captured about two-thirds of one of the healthiest specialty nail markets, fastening of asbestos siding and roofing. Aluminum's resistance to asbestos acids and its lower cost compared to other suitable metals made this a natural.

Hold Since War I

At the beginning of 1951 not one major asbestos building products company furnished aluminum nails with its products. At the end of the year the roster included Johns-Manville, U. S. Gypsum, Flintkote, Philip Carey, Pabco, and Rubberoid. Now they're buying all they can get.

Alcoa's initial experimental batches were used in oil derrick construction in the sour gas region of Texas about the time of World War I. Corrosion cut through other nails within weeks or months. Those first aluminum nails are still in good shape.

Other Markets Added

Redwood and red cedar, like asbestos, contain acids for which aluminum has good resistance, providing another application. Tremendous growth of aluminum roofing and siding creates further demand to eliminate the galvanic corrosion which results when dissimilar metals are in contact and exposed to weather.

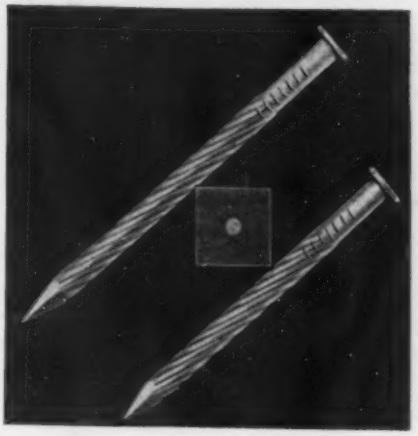
Some paint manufacturers have recommended aluminum nails for outdoor applications since they do not stain. As a result it is unnecessary to putty them and aluminum nails have found many friends among builders.

Successes like these naturally attract more producers. Nichols is still the largest producer but several others have joined in, Alcoa being the latest. The Nichols firm welcomes this competition, feeling that it will result in a better product and faster acceptance by consumers.

Aluminum Nail Production

Year	Pounds
1947	1,418,590
1948	2,846,980
1949	1,276,027
1950	1,916,657
1951	2,617,457
1952	2,897,853
1953	3,863,000*

*Estimate based on first half.



SPECIAL aluminum nails for asbestos siding. Serrations grip fibers as in square inset.

Also welcomed are the substantial advertising campaigns the big aluminum companies can contribute to market development.

Initially, carpenters claimed the nails were difficult to drive without bending and that they wouldn't hold. And they weren't entirely wrong. But research has led to an improved product with a thickened shank and an etching process which doubled holding power.

Faster nail machines and continuous casting of wire rod (THE IRON AGE, Apr. 23, p. 77) have trimmed production costs. And a concentrated marketing campaign has gone a long way toward ending the public's misconceptions on aluminum nail prices.

Nails were traditionally sold by the pound and the price of a pound of aluminum nails is far above the price of a pound of steel nails. But on the job, a pound of aluminum nails goes nearly three times as far because of the weight difference.

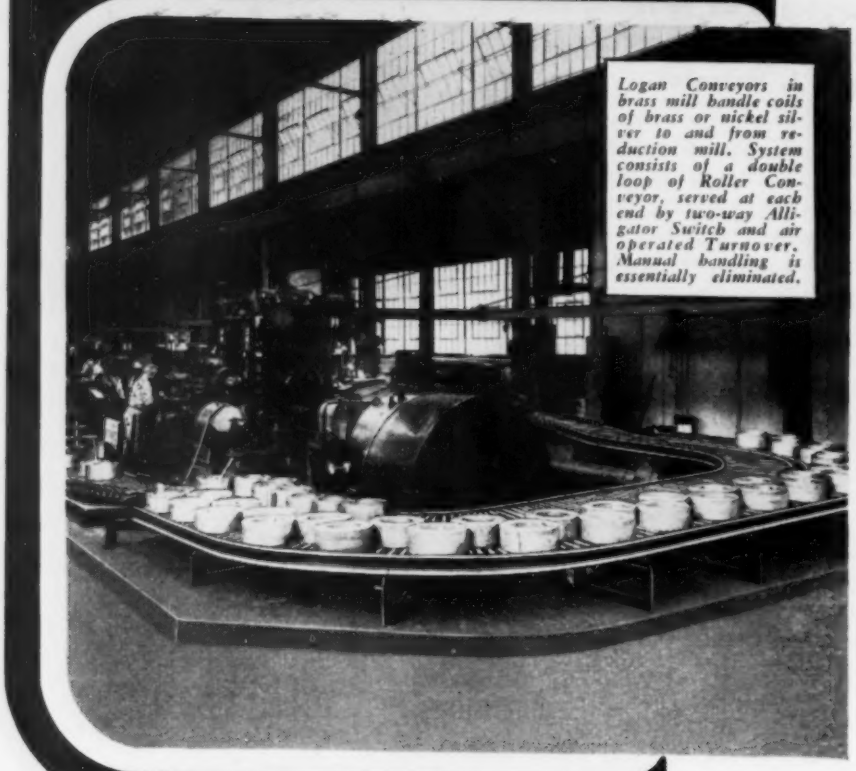
Sees 300 Pct Boost

So the Nichols company turned to boxing the nails according to size and number required for specific jobs. This gimmick not only helped overcome the weight concept but it also enables the small user to buy only as many as he needs for the task at hand.

For the future, Frank Nichols predicts at least a three-fold growth over the next 5 years.

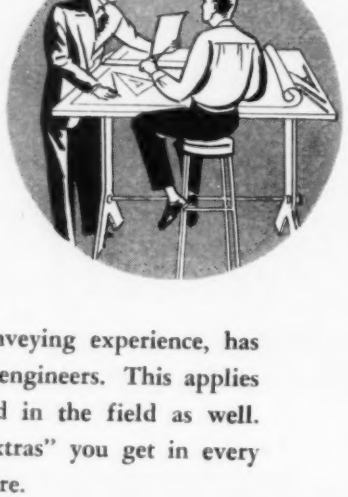
Natural applications are areas where nails are exposed to moisture, salt air or corrosive atmosphere.

You don't buy Conveyors by the pound . . .



Logan Conveyors in brass mill handle coils of brass or nickel silver to and from reduction mill. System consists of a double loop of Roller Conveyor, served at each end by two-way Alligator Switch and air operated Turnover. Manual handling is essentially eliminated.

When purchasing conveyors — you buy equipment which constitutes a smooth, workable plan for moving products through various plant processes. The heart of this plan is *engineering.* Returns to you — in time, effort and space saved, are in direct proportion to the skill and care exercised on the drafting board.



Logan, with two generations of conveying experience, has justifiable confidence in its staff of engineers. This applies to personnel at the home plant and in the field as well. Engineering talent is one of the "extras" you get in every Logan installation. Write for literature.

Logan Conveyors

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

ELECTRONICS: Mak

Completely automatic driving is for the future, but some driving aids may come soon.

It will be many years before you'll be able to hop into your car, press a button, and then sit back and read THE IRON AGE while electronic controls drive you smoothly and safely to your destination. But it may not be too long before your car is equipped with electronic aids that will prevent collisions and make bad weather driving easier.

Radio Corporation of America's electronic scientist, Dr. V. K. Zworykin, believes recent scientific advances such as development of transistors have brought electronic driving aids near practical application. To prove it, he has been responsible for development of a model 5-ft car which has many automatic control features.

How It Works

Dr. Zworykin's battery-powered car model has attracted a lot of publicity because it can: (1) Steer itself along a prescribed route, (2) stop itself when approaching a metal obstruction, (3) turn out of its original lane to pass a car.

In the laboratory setup, the model car is guided by a wire which represents a cable that would be laid in a highway roadbed if the idea were adapted on a practical basis. The wire sets up a magnetic field of a certain frequency which is picked up by two coils located on each car side.

If one coil receives a stronger signal than the other, it means the car is not centered over wire. When this happens, electronic equipment controlling the steering wheel brings the car back on course.

To prevent collisions, simple transistor circuits associated with the guide wire send out warning signals whenever there is an obstruction on the wire. These warning circuits produce a "radio tail" at the back of any sizable metal obstruction on the route. When equipment in the car receives the

Car Driving Automatic

warning signal, the brakes go on automatically.

Dr. Zworykin says the basic requirements of an automatic driving system fit in perfectly with the current trends in highway construction, such as elimination of left turns by cloverleafs and construction of at least two lanes for each direction.

Use Long Highways First

Making the changeover to automatic driving would not require sudden abandonment of established driving habits nor wholesale installation of new equipment on roads and vehicles.

To make the switch practical, drivers would have to retain freedom in choice of speeds and choice of manual or automatic control. Automatic driving would have to be restricted at the beginning to high-speed, long distance highways.

Second step in the automatic driving system would be use of guidance equipment to prevent collisions. Dr. Zworykin says the essential feature of one proposed system is the transfer of energy from a high-frequency power cable to a series of transmitters along the lane.

In this arrangement, transfer of energy is controlled by the passage of a car and long constant circuit or "memory" which would keep the transmitter functioning for a while after the car had passed.

Look—No Driver

The oscillations would be transmitted backwards along a high attenuation cable and sensed by pickup coils on following cars. As a result, every car would be followed by a flying tail of warning signals. Amplitude of these signals would increase as the car slowed down, and would hit a maximum for a stalled car.

In addition to making driving much more pleasurable, automatic control also holds out the intriguing possibility of driverless freight transport. This may result in cheaper, speedier transport.

the A-B-C of M-S-T

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B BETTER PRODUCTS
C AT LOWER COST

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Carbon 1010 to 1025

Michigan Tubing has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Washing Machine Center Tube Shaft

The meticulous workmanship that goes into every piece of Michigan tubing is well illustrated by the center tube shaft manufactured by Michigan for a washing machine.

In the production of this part, absolutely accurate finishing to the closest tolerances is required. For example: at the head—I. D. plus or minus .001, O. D. plus or minus .003. Tube O. D. is 2.50 inches, with .120 gauge thickness. Michigan's know-how and modern precision and production equipment makes it a simple matter to conform to close tolerances and ship parts ready for assembly by the customer.

We invite manufacturers to consider the advantages in cost savings and product improvement by the use of Michigan tubing.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

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CLEVELAND: New Industry Seeks It Out

"Best location" has attracted $1.5 billion in industrial growth since V-J Day . . . Steel, metalworking, ore are backbone . . . Production highly diversified—By *R. M. Lorz.*

The "best location in the nation" is beginning to attract crowds.

Clevelanders who have witnessed investment of $1.5 billion for industrial growth since V-J Day insist the "best location" tag isn't a catch phrase. Visitors who need convincing are likely to wind up on a guided tour that leads from the "flats" near the mouth of the Cuyahoga River to tree lined suburbs scattered in a great semicircle bisected by Lake Erie.

Most people are really impressed with what they see. In the historic flats where industry was born in Cleveland hundreds of metalworking shops crowd around giant blast furnaces waiting for the steel which may bring a golden era.

In this narrow strip of territory production is as diverse and interesting as the "grocery" boats which chug up the Cuyahoga with supplies for Great Lakes ore boats.

Although Cleveland plants turn out hundreds of products, steel, metalworking and ore are the backbone of the Forest City. They have been ever since the Mather and Otis families took a chance on steel and red gold in the mid-1800's.

Progress in Cleveland has always been gradual and solid. Old timers versed in the lore of the Western Reserve emphatically state that there hasn't been a boom in the neighborhood since the Ohio Canal was opened up in 1832.

Visiting firemen wandering past ultramodern plants in fast growing suburbs are puzzled by statements like these. New plants have sprung up, population has increased and unemployment has gone down. What happened?

Cleveland's Industrial Growth

	Industrial Space Added	Payroll Dollars Added
1946	1,590,540 sq ft	$11,291,700
1947	3,049,790	17,685,200
1948	791,110	5,059,200
1949	616,790	3,507,840
1950	5,215,770	30,913,400
1951	549,430	4,146,500
1952	730,545	5,884,776

Cleveland industrialists say the seeming paradox is the natural result of steady growth, diversity of product and salesmanship. Growth is a matter of record and the story in statistics is impressive. Cleveland has only 1 pct of the country's population, but accounts for 2.06 pct of the nation's manufacturing production, according to "value added" census figures.

Heavy industry is also well represented by figures which show the Forest City has over 4 pct of the country's blast furnace capacity, 3 pct of the production of steelworks and rolling mills, 8 to 10 pct of all American-made strip, sheet and plate and 7-8 pct of the country's wire drawing capacity.

Expansion in steel since 1945 has been terrific. Virtually completed is Republic Steel Corp.'s $75 million plus program which has added 672,000 tons to the annual total of steel production in the Cuyahoga Valley.

Machinery Leader

Some costly items which ran up the bill: 126 coke ovens, a 1470-ton-per-day blast furnace, four openhearth furnaces with 275-ton-per-day capacity, a 72-in. cold reducing mill and new 72-in. temper mill, new soaking pits and blooming mill improvements.

Jones & Laughlin has also added a 1300-ton-per-day blast furnace, annealing, cold rolling and other facilities, bringing total output up to 360,000 tons. American Steel & Wire, a subsidiary of U. S. Steel, is also constructing a 1350-tons-per-day merchant pig iron blast furnace. Other plans include a new rod mill which will up production from the present 313,000 tons per year to 450,000 tons annually.

Most of this steel will find a home in hundreds of metalworking shops. A sizeable share will go to the metal fastener industry. Makers of bolts, nuts, screws and rivets in the area produce about 17.5 pct of the country's total production. In the allied screw machine products field Cleveland firms account for an estimated 4.5 pct of total U. S. production.

Cleveland's present position in machinery and industrial equipment is also an important factor. While it has traditionally finished second to Cincinnati as a machine tool center, over 9 pct of the nation's machine tools are made in Cleveland.

Center of the turret lathe industry, Cleveland produces over half of the country's output in a normal year. Production of cutting tools, dies, jigs and fixtures also figures prominently, with Cleveland companies producing 8 pct of the nation's total.

Automotive, chemical, plastic, rubber, glass, aviation, textile and garment industries also play a prominent role on the industrial scene. In relation to manufacturing and employment Greater Cleveland firms produce products valued at over $4.9 bililon in 1952.

An estimated 223,700 hourly workers were paid about $934 million to produce this wealth.

Campaigns for Growth

Selling Cleveland has proved profitable to any number of civic organizations which decided in 1944 to sell the nation on the best location.

When kudos are passed out for the selling job the aggressive Cleveland Electric Illuminating Co. takes a front position.

Since the campaign got underway, Ford Motor Co., General Motors, Alcoa and many other firms have spent millions on suburban plants. Others like Lincoln Electric, Thompson Products, Euclid Machinery, and Clevite Corp. have erected ultra-modern plants.

Because central areas were naturally congested growth in Cleveland has been peripheral.

In greater Cleveland chemical industries are springing up in the Painesville-Ashtabula areas.

Within a 500-mile radius of Cleveland lies 54.5 pct of American and Canadian population, 63 pct of American manufacturing plants, 67.5 pct (est) of the nation's produce value, 74 pct of American payroll dollars, 57 pct of retail sales, 62 pct of wholesale sales.

HOW THE COURTS PROTECT YOU
IF OUR WORKERS OWNED THIS COMPANY
Furniture Making
AND THE TOOLS YOU NEED
Six Ways to Make People Like You

READING RACKS: Tell Your Story

More than 1500 companies find reading rack booklets are effective way to inform workers . . . Publications cover many fields, cost little . . . Widely read—*By E. C. Kellogg.*

For years management has been trying to educate employees on company matters, safety and economic principles, as well as general topics which would make them happier, better workers. Attempts have been made at force feeding information and the results weren't good.

But a little more than 4 years ago, General Motors (followed by Western Electric and du Pont) pioneered the wiser and much more effective technique of placing interesting, informative booklets in racks conveniently located around their plants. This approach gave employees complete freedom to pick up the literature they wanted to read.

Use Is Spreading

Experience has shown that most employees do pick up the booklets, 50 pct on a regular basis, 99 pct occasionally.

Effect of the reading rack programs isn't limited to the plant either, as 95 pct of those who pick up literature take it home to their families. Recent example of this was a steel mill where workers cleaned out racks of "how to knit" booklets in a few hours.

Success of the reading rack as a means of informing and improving workers, as well as creating a friendlier management-employee atmosphere, has caused more than 1500 companies to adopt the idea.

With this tremendous growth, several commercial firms have emerged which supply suitable, well balanced reading material at low cost. Among the best known are Good Reading Rack Service in New York, and National Research Bureau in Chicago.

Cost 6¢ Per Copy

Though many firms prefer to put out their own publications, the general trend is toward use of commercial sources because they are usually able to do a better job at lower cost. In addition, the company is saved the time and trouble of preparing literature.

Huge circulation of the booklets enables commercial suppliers to sell the publications for as little as 6¢ per copy. Good Reading Rack Service, which started in business only 2½ years ago and is now distributing 5 million copies per year, says cost of its services to users is about $1.56 per employee per year, assuming that an average of one out of two workers will pick up the booklets. New literature is shipped each week.

Reading Matter Range

Material covered in the booklets ranges from personal grooming to discussions of free enterprise. Good Reading Rack told THE IRON AGE its most popular booklets have been a condensation of Dale Carnegie's *How to Win Friends and Influence People*, a baseball booklet, and a leaflet entitled, *Let Freedom Ring*.

Among the booklets currently being distributed are: *Plumbing Care*

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and Repair, Pet Projects on Your Money, Danger Signals in Your Life, How The Excess Profits Tax Hurts You. Also on the current listing is a leaflet titled, *If Our Workers Owned This Company*, which describes some of the problems that would have to be faced if employees bought control of U. S. Steel.

What They Cover

In publishing its booklets, many of which are reprints of articles by well-known writers or leading government and industry spokesmen, Good Reading Rack Service strives for a balanced diet. The company believes it has to provide a lot of general interest publications to get employees to accept heavier material on subjects which management may believe are more important.

Breakdown of the types of material presented in the booklet series is: Health and safety (at home and work), 10 pct; home and recreation, 25 pct; inspirational and self-help, 35 pct; social and economic problems, 35 pct; Americana, 5 pct. Length of the booklets ranges from 12 to 32 pages.

Racks Cost Little

Companies interested in experimeting with commercial reading rack services can do so on a trial basis, since no contracts are involved in most of the plans. Orders can be cancelled at any time, and unused booklets may be returned for full credit.

Racks are offered at cost and range in price from $3 for small groups to $45 for racks to service 400 people. Management has a chance to screen the publications as advance copies are sent out. Substitutions can be made if desired.

Some companies using a reading rack service occasionally insert special materal of their own. They have found that acceptance of the inside material is improved because the pick-up habit has been established.

What Users Say

Comments from industrial users of reading rack services show they have been warmly received:

". . . your service has gone over with a bang and it is probably one of the best used services we have anywhere," *Doehler-Jarvis Corp.*

"This program has been received with considerable enthusiasm and interest by employees. . . All levels of management seem enthusiastic about it," *Aluminum Co. of America.*

Employee reaction is also strongly pro reading racks. One large manufacturing plant surveyed its workers and found that only 1.3 pct disapproved of the idea, and National Biscuit Co. asked some of its employees for comments and received statements like: "I think the rack is the wisest thing they have done here in a long time. . ."—"Would like to see more material based on the political problems. . ."—"I like the booklets very much. They learn us very much."—". . . my wife always asks where I obtained so good reading material."

Industry's Reading Racks are Busy

Company	No. of Employees Exposed	Booklets Received Each Week	Pct of Employees That Pick Up Books	Receiving Enough Books?	Union Opposed?
Alcoa	18,000	10,000	55%	yes	no
American Airlines	1,500	825	55%	yes	no
Atlantic Refining Co.	1,800	1,600	89%	no	no
P. Ballantine & Sons	4,000	2,250	56%	no	no
General Tire & Rubber Co.	2,800	800	35%	no	no
The Hanover Bank	2,000	800	40%	no	no union
Kelsey Hayes Wheel	3,200	1,950	61%	no	no
McCall Corp.	3,000	1,500	50%	no	no
Pittsburgh Plate Glass	22,000	11,200	51%	yes	no
Russell, Burdsall & Ward Bolt & Nut Co.	650	225	35%	no	no
Standard Oil Co.	1,500	800	53%	yes	no

Figures Based on plant surveys by Good Reading Rack Service.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Vacuum pump, 1181 ea, $477,483, Bendix Aviation Corp., Teterboro, N. J., *F. A. Battel.*

Fuel valve, var, $136,344, Gladden Products Corp., Glendale, Calif.

Fuel valve, var, $72,588, Wm. R. Whittaker Co., Los Angeles.

Valve assy, var, $758,921, The Parker Appliance Co., Cleveland.

Rack, power, unit and tank unit for P2V-5, 6 aircraft, var, $95,934, Minneapolis-Honeywell Regulator Co., Minneapolis, *S. F. Keating.*

Spare parts for support of P&W engines, var, $109,380, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Spare parts for misc jet engines, var, $47,418, Westinghouse Electric Corp., Philadelphia, *W. C. Wilson.*

Spare parts for P&W engines, var, $345,021, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Items used on P&W engines, var, $1,200,104, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Spare parts for P&W engines, var, $1,576,125, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Material for use on P&W engines, var, $5,812,298, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Material for P&W engines, 3085 ea, $86,812, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Spare parts for P&W engines, var, $2,383,589, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Material for P&W engines, var, $175,477, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Spare parts for P&W engines, var, $412,160, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

Spare parts for support of P&W engines, var, $510,656, United Aircraft Corp., East Hartford, Conn., *E. E. Champion.*

the 3rd. DIMENSION

May be the difference Between PROFIT and LOSS

Here's how *MicroRold*® Stainless Steel *Saves You Money*

The third dimension, or gauge thickness, is extremely important in the purchase and use of stainless steel. Job costs are figured on a square foot of stainless area basis while stainless sheets are purchased on a weight basis. Each one-thousandth inch saved in thickness saves 1.26 pounds per sheet.*

When sheets are ordered by gauge number, the permissible A.I.S.I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge you may receive sheets .052″ thick, when a thickness of .0475″ would suit your purpose. Using a standard 18 gauge 36″ x 120″ sheet as an example, the theoretical weight is 63.00 pounds, but this weight could permissibly vary between 59.22 pounds and 65.52 pounds.

MicroRold sheets may be ordered by gauge number and you may specify they be rolled on the light side of the gauge range. This is true because the company's equipment is such that more accurate control of thickness is possible.

If you are not a user of MicroRold sheet it will pay you to get the full details. Your steel warehouse distributor will gladly tell you the MicroRold story.

**36″ x 120″ standard size sheet.*

WASHINGTON STEEL CORPORATION
Washington, Pennsylvania

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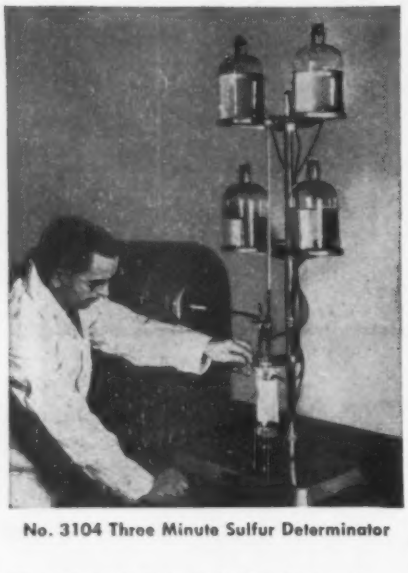

No. 3104 Three Minute Sulfur Determinator

The Dietert-Detroit Sulfur Determinator used with the Varitemp or Hitemp Combustion Furnace provides the most practical means of getting results in a few minutes with accuracy equal to or better than any other method.

APPLICATIONS	FEATURES
Metals and Ores	Lowest First Cost
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Let our chemists suggest a complete ready-to-go set-up to solve your sulfur analysis problems.

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Industrial Briefs

New Moniker . . . RADIO-ELECTRONICS TELEVISION MANUFACTURERS ASSN., Washington, is the new name of the Radio-Television Manufacturers Assn.

European Show . . . The third annual EUROPEAN MACHINE TOOLS EXPOSITION will be held at Brussels, Sept. 4 to 13.

New Prexy . . . NATIONAL ASSN. OF SCALE MANUFACTURERS elected George C. Worthley, manager, Scale Div., Fairbanks, Morse & Co., Chicago, as president.

Honorary Degree . . . WORCESTER PRESSED STEEL CO.'s John W. Higgins, chairman of the board and treasurer, has been awarded the honorary degree of Doctor of Engineering by Worcester Polytechnic Institute, of which he is a graduate.

Solar Energy . . . UNIVERSITY OF WISCONSIN will be the meeting place for 30 of the top scientists studying utilization of solar energy on Sept. 12-14.

Time Marches On . . . CORNELL IRON WORKS, INC., Long Island City, N. Y., celebrated its 125th Anniversary last month.

Well Done . . . CHRYSLER CORP.'s Plymouth Plant, Detroit, has been awarded the National Safety Council's Award of Honor, for its outstanding safety record during 1952.

Big Move . . . KOPPERS CO., INC., has moved the headquarters of the Freyn Dept, Engineering and Construction Div., from Chicago to Pittsburgh.

Test Chambers . . . TENNEY ENGINEERING, INC, Newark, has received an order for 19 stratosphere chambers from the Gentile Air Force Base for assignment to domestic and overseas air bases.

Buys Plant . . . AEROQUIP CORP., Jackson, Mich., has purchased Sterling Electric Motors plant in Van Wert, Ohio, which will be headed by Don T. McKone, Jr., as general manager.

Created . . . CATERPILLAR TRACTOR CO. has created an Engine Div. which will be managed by H. H. Howard.

New Rep. . . . ADAMAS CARBIDE Corp., Harrison, N. J., has appointed Tool Specialists, Inc., Westbury, L. I., as its northern New Jersey sales representative.

New Home . . . JOHN HASSALL, INC., has moved into its new plant in Westbury, L. I.

New Company . . . PARKS & GREEN CO., 396 Broadway, N. Y., is a newly formed company which will specialize in the sales of screw machine and production tooling. Oliver J. Green and Robert Parks are the partners.

Gets Contract . . . ACF-BRILL MOTORS CO.'s Hall-Scott Motor Div., Berkeley, Calif., has been awarded a contract for the production of transmissions, drives and parts for landing vehicle transports, amounting to almost $2 million.

Play Host . . . The Management Club of SCULLY-JONES & CO., Chicago, played host recently to a group of representatives of machine tool builders from the northern Illinois area.

Higher Education . . . PENNSYLVANIA SALT MFG. CO., Philadelphia, has awarded the $1200 college scholarship it gives each year to Miss Joanne Sheets, daughter of Edwin A. Sheets, Wyandotte, Mich., maintenance repair foreman in the Sharples Chemicals, Inc., plant, a Pennsalt subsidiary.

Changes Name . . . PENNSYLVANIA MALLEABLE IRON CORP., Lancaster, Pa., is the new name of Carbon Malleable Casting Co.

Arkansas Distributor . . . MARION POWER SHOVEL CO., Marion, Ohio, has appointed Kern-Limerick, Inc., as its distributor in Arkansas.

Stopped Chugging . . . LACLEDE STEEL CO., Alaton, Ill., retired from service recently an old steam engine to clear the way for the installation of a new 5000-hp Westinghouse electric motor.

Dedicated . . . ENTIN Industrial Terminal, River Rd., South Parkway, Clifton, N. J., was dedicated this week with 200 industrialists and others attending the ceremonies.

Fig. 1. Photomicrograph of sheet with large irregular grains. Printing quality not up to par.

Fig. 2. Changes in plating conditions produced crystals more columnar in shape. A step in the right direction.

Fig. 3. Here is the structure that was found to give consistently good results. The copper deposit is of intermediate hardness and contains long, thin columnar crystals.

research at work!

A LABORATORY CAN SHORTEN THE SEARCH FOR A BETTER PROCESS

Copper, a basic and important requisite for the printing of Sunday magazines for metropolitan newspapers, has—since the introduction of rotogravure printing process in the United States—suffered from cylinder wear marks which have kept the industry puzzled, and often resulted in defective printing to such an extent that blemishes in printing were easily discernible to the eye—and although not too disfiguring, there remained the necessity for their elimination for the purpose of perfecting the gravure printing operation. In collaboration with a publisher, owner of one of the most modern plants in the world, Revere Copper and Brass solved this perplexing problem and is continuing to contribute to the technical improvement of the rotogravure printing process.

In preparing cylinders for printing roto sections, copper is plated on them before engraving. The electroplating of copper is rather an old process, and its techniques are well understood. By varying current density and composition of the solution, many different types of copper deposit can be obtained. But which of the various methods would give the best results in this case? Rather than engage in a lengthy process of trial and error, the publisher, who felt that the crystal structure of the deposited copper held the key, asked us if we would collaborate.

What Were the Crystals Like?

Sheets of copper resulting from different plating techniques were sent to Research, which not only made photomicrographs of the grain structure, but also determined tensile strength and hardness. As was expected, there were large variations. Some specimens had large and irregular crystals; in others, they were long and thin, like fibers standing on end. In tensile strength, the range was from about 31,000 to 56,000 p.s.i. Diamond Pyramid hardness numbers ran from 62.9 to 141.5.

Over a period of time five different sets of samples were submitted to the laboratory, which made detailed reports on each. By correlating these with his own records, the publisher was able to evaluate the effects of changes in plating techniques. The field of his investigation became narrower after each laboratory report, and in the end it was possible for him to obtain medium-hard, fine grain deposits which require little grinding and polishing. These results now are duplicated daily on a commercial basis. Today the publisher is noted for the exceptionally fine printing quality of his rotogravure sections. The newspaper is The Inquirer, Philadelphia, Pa.

If You Do Not Have a Laboratory

This is an outstanding example of the value of applied research. Many companies occasionally need information that can only be supplied by a laboratory, but are not justified in spending the large sums required to buy and maintain scientific equipment, and to employ qualified research personnel. These firms naturally seek outside sources of the data they require. Revere was glad to cooperate in this instance, because it produces large quantities of copper anodes for plating, and has both the equipment and the experience to make thorough tests of electro-deposited copper sheets or layers.

* * *

The Revere Research Department operates a laboratory that contains the latest scientific equipment, including the spectrograph and X-ray diffraction apparatus. If you feel the need of laboratory work on copper and its alloys, or aluminum alloys, please get in touch with the nearest Revere Sales Office.

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COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.— Sales Offices in Principal Cities. Distributors Everywhere.

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Detroit Is Scrap Generating Center

Largest single steel consuming industry is also largest producer of scrap . . . Automakers offer for sale over 100,000 tons monthly . . . Get top prices—By R. D. Raddant.

Midway each month a series of lists are mailed from each auto plant. They go only to the scrap trade, but to this group they are of vital interest.

These lists are the tonnages of scrap, by quantity and classification, that each company is offering for sale the following month. Some scrap experts believe these lists go a long way toward establishing the level of the scrap market.

Biggest Producer . . . It's an old story that as the leading consuming industry the auto business is a dominating factor in the steel market. Reversing the situation, the auto industry is also the biggest industrial producer of scrap.

It is impossible to determine exact figures, but the auto industry offers more than 100,000 tons of scrap for sale each month. Most of it is premium quality scrap and commands a premium price, several dollars over dealer scrap.

What They Offer . . . Frequently a scrap broker's success in Detroit is determined by how much automotive scrap he purchases for his clients, at a reasonable price. This is what scrap buyers and brokers are bidding on for August from the respective auto companies:

Fisher Body (all plants): 47,400 tons of No. 1 bundles, 6900 tons of new factory busheling.

Chrysler: 208 cars of No. 1 bundles, 102 cars of punchings and plate, 103 cars machine shop turnings, 161 cars borings and turnings, and lesser tonnages of No. 1 and No. 2 heavy melting steel, short turnings and other classifications.

Cadillac: 20 cars of low alloy NAX steel, 30 cars electric furnace bundles, and smaller tonnages of short steel clippings, steel punchings, borings and turnings, and miscellaneous grades.

Ternstedt Div.: 36 cars of new factory busheling, 47 cars of No. 1 bundles, 2 cars of No. 1 heavy melting steel.

Buick: 3050 tons cast iron borings and turnings, 22 more cars of cast iron borings and turnings, 900 tons of new busheling, 2400 tons of No. 1 bundles, 2 cars of stainless.

Detroit Transmission: 2000 tons borings and turnings, 2000 tons machine shop turnings.

Oldsmobile: 2200 tons No. 1 bundles, 500 tons new busheling, 1000 tons machine shop turnings, 700 tons cast iron borings, 500 tons flashings.

Chevrolet Gear & Axle: 3200 tons machine shop turnings, 5800 tons of punchings and clippings, 1200 tons miscellaneous.

Pontiac: 300 tons No. 1 bundles, 1400 tons punchings and plate, 600 tons turnings and borings, 100 tons stainless.

This, obviously, does not represent all the automotive scrap generated. Some companies and divisions offer their scrap on alternate months. Some are on contract. At least two are closed down. Ford generates quantities of scrap that must run about 50,000 tons each month, but most of it goes into its own captive mill and electric furnaces.

Automotive Production
(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Aug. 1, 1953...	141,925	27,765
July 25, 1953...	143,587	29,287
Aug. 2, 1953...	17,031	5,150
July 26, 1953...	34,870	7,675

*Estimated Source: Ward's Reports

Foundry Use High . . . Many of the automotive divisions use much of their own scrap in their foundries, which accounts for the comparatively low tonnages from some of the specific lists.

Purpose of listing these tonnages is to give an idea of the magnitude of automotive scrap. It gives an idea how scrap can be used as a trading factor in times of steel shortages, particularly if they occur when scrap is scarce.

Willow Run Dim . . . Future of the giant Willow Run plant is very much in doubt. Even Edgar J. Kaiser, Kaiser Motors president, admits it will close indefinitely unless a new union contract is negotiated.

Mr. Kaiser seeks a contract that "fills our competitive position," explaining that the old contract is "not applicable to the volume we do."

That Kaiser's old contract was not practical has been generally recognized throughout the auto industry. It figured prominently in discussions of cancellation of Kaiser's lamented aircraft contract. Major points of issue are job classifications and union steward representation.

Despite Mr. Kaiser's assertion that Willow Run is not a white elephant, its future seems dim, at least as far as Kaiser's operations go.

Not Enough . . . Even if Kaiser reopens, plans are for only about 3000 hourly employees and 1000 salaried, scarcely enough to sustain

Willow Run's mammoth facilities.

If union negotiations fail, Kaiser assemblies will be carried on at other Kaiser plants on the West Coast or possibly at Willys, its new and healthy subsidiary.

Meanwhile, sales operations of Kaiser Motors and Willys are being consolidated with a new Kaiser-Willys Sales Div. Other consolidations of purchasing, accounting, engineering, and even public relations are effecting new economies.

Ford Output at Postwar High

General Motors is not the only major auto producer that is headed for a good year. Ford does not publish financial statements, but other figures indicate it is in for a substantial profit.

Ford employment has reached an alltime high and manufacturing schedules for the second half are set to exceed first half production. In the first half of 1953, Ford produced 658,000 cars and 128,000 trucks. This is still below the 1952 rate when Ford built 1,556,000 cars, a postwar record. Ford officials believe this total will be approached before the year ends.

Unit records are difficult to achieve at Ford, however. Records set back in Model T days may last forever.

Fork Truck Has Shiftless Drive

Latest improvement in the materials handling field is a forklift truck with automatic transmission now in production by Clark Equipment Co.

The transmission, called the Hydratork Drive, employs only three simple controls, the accelerator, brake pedal, and forward-reverse selector lever on the steering column.

Advantages of the new transmission, which consists of a torque converter combined with a simplified single-step, constant mesh, forward-reverse transmission, are ease of operation as well as elimination of the clutch maintenance problem.

Because the lift truck is confined to start-stop motion, clutch mortality is excessive on standard drives. Its speedier operation is said to give the Hydratork Drive a major time saving advantage.

It costs $370 and is available on the 6000-7000 lb capacity range. It will be available on the 10,000-lb range in September and smaller units by January.

The fork lift truck is one of the fastest gaining in use of all materials handling equipment. Lift truck output in 1939 was only about $7.5 million compared with $200 million last year. The auto industry alone uses about 15,000.

GM Unit Sales Set New Record

Harlow H. Curtice's ambition, record sales and unit production in his first year on the job as General Motors president, seems well within his grasp.

Second quarter figures just released show that unit sales of GM cars and trucks reached the highest level for any quarter in the company's history. Dollar sales were 39 pct over the same period last year.

In the first 6 months of 1953, net sales amounted to $5,441 million and net income $313 million. Earnings on common stock were equivalent to $3.51 per share. Total taxes reached $764 million.

Biggest gains were in the passenger car divisions. Sales of cars in the second quarter were 63 pct higher than in 1952 and 65 pct higher for the first 6 months.

Previous full year sales reached $7,549,154,419. Even with a slump in the last half, it is certain that a new record will be set.

Defense sales in the first 6 months of this year reached $942 million.

Ready New Sealed Beam Headlamp

An improved sealed beam headlamp is in the final stages of development and should be approved for national acceptance by late fall.

The new unit, which will be interchangeable with present headlamps is the result of improved high distribution pattern, especially for the lower beam along the curb and road shoulder.

THE BULL OF THE WOODS — By J. R. Williams

VASS MOX DU, CARL? VASS ISS LOHSE MIT?
FROM DIS ISS VON TOOT BRUK OUT, NO?
A GUY WITH A NEW FOREIGN HELPER ALWAYS THINKS IT'S A DANDY TIME TO LEARN A LANGUAGE AN' SETS TH' GUY BACK LEARNIN' OURS!
THAT'S WHAT'S MADE OUR LANGUAGE, THOUGH--NEITHER ONE OF 'EM GETS IT QUITE RIGHT AND YOU HAVE A NEW LANGUAGE...LIKE MINE, FER INSTANCE!
J.R.WILLIAMS
THE HANDICAPPER

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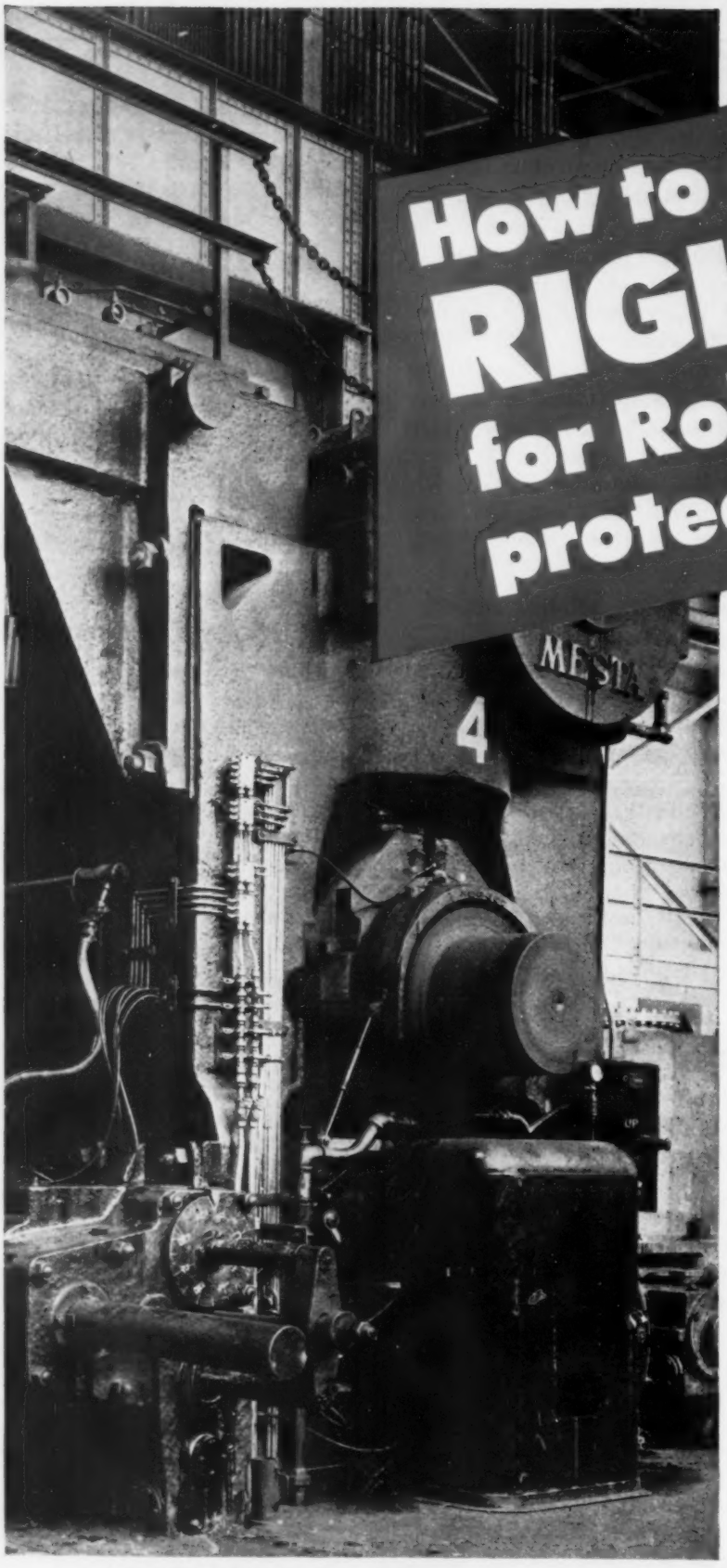

How to select the RIGHT OIL for Roll Neck protection . . .

For the oil circulating systems of your roll stands, choose an oil that has high resistance to emulsification, oxidation and sludging. *Texaco Regal Oil* is turbine-quality oil with both these needed characteristics — and *more.*

Texaco Regal Oil separates rapidly from water that may work its way past the seals. This, in conjunction with its high resistance to oxidation, assures that bearings will stay clean and lines clear — free from sludge. *Texaco Regal Oil* thus keeps bearings fully lubricated. Roll necks roll on a film that stands up under the severest conditions. You benefit through smoother operation, longer bearing life, lower maintenance costs.

For your enclosed reduction gears, use *Texaco Meropa Lubricant* — noted for its EP stability, its resistance to oxidation, thickening and foaming.

Let a Texaco Lubrication Engineer help you improve machinery performance and reduce costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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(HEAVY CIRCULATING OILS)

Truce Reaction Will Be Gradual

Defense Dept. will stretch out contract cancellation . . . Try to help industry shift smoothly to civilian production . . . Cut fall draft, but step up '54 rate—By G. H. Baker.

Effect of the Korean truce upon industry's production and labor problems will not be noticed immediately, judging by present thinking of the Defense Dept.

Any cancellations or readjustments of contracts now on the books will be gradual. Such cuts are to be spread over the long pull, not imposed abruptly. Closely-knit liaison between the military and defense contractors is being developed to smooth the transition to civilian production.

The Pentagon wants earnestly to aid industry cushion any possible jolts—such as widespread unemployment—resulting from contract terminations.

Cut Draft Calls . . . Personnel-wise, the Defense Dept. plans to cut its monthly draft calls around Oct. 1 to about 19,000 men. (Draft rate has been running about 23,000 men per month.) This reduced rate will then continue throughout the balance of this fiscal year. This means a definite slowup in the drain upon industry's skilled manpower, and better availability of untrained help during the next 11 months.

Starting in July 1954, however, monthly draft calls are to be stepped up to 45,000-46,000 men per month. About 600,000 men are to be drafted in fiscal '55. This is twice the number scheduled for drafting during the current fiscal year.

End Pipeline . . . Reason for the cut-back from now through next June is the termination of the "manpower pipeline," which was needed during combat operations. Defense Dept. disclosed last week that during the Korean war there were at all times about 56,000 men in this "pipeline," which extended from recruit training centers to the firing lines.

See Atomic Navy . . . Battlewagons, carriers, and other naval vessels of the near future will be propelled by atomic power. That's the flat prediction of John J. Floberg, who has just resigned his position as Assistant Secretary of Navy for Air.

Atomic power for ships today is in the same stage of development that steam power was in Robert Fulton's time, Mr. Floberg claims. Combat ships of the future, he says flatly, "will be virtually all nuclear-powered."

Atom Carrier Delayed . . . First atomic-powered carrier probably won't be laid down for another 2 years, however. The Navy now is operating one atomic-powered sub, has another under construction. Secretary of Defense Charles Wilson ordered the atom-driven carrier postponed on economy grounds.

U. S. Atomic Energy Commission has authority to spend $7 million in this fiscal year to develop nuclear reactors for powering ships and producing power for industrial use.

Stop Competing . . . Sale of the government's deficit-ridden river barge business is cheered by congressional Republicans as tangible evidence that the Eisenhower Administration means what it says about ending Washington competition with private enterprise.

Purchase of the 30-year-old shipping system by the St. Louis Shipbuilding & Steel Co. should net the government about $2.7 million in cash and accounts receivable in addition to the sales price of $9 million.

Pay From Earnings . . . From 1939 through 1952, the barge lines (which operate on the Mississippi, Missouri, Illinois, and Warrior Rivers) piled up losses totaling $9,749,000. This means a loss in 12 out of 14 years—even though the lines paid no taxes as did their private competitors.

Herman T. Pott, president of the St. Louis firm and chairman of the new Federal Waterways Corp., a wholly-owned subsidiary, says he expects to pay the entire purchase price out of earnings during the next 10 years.

Small shippers and other less-than-bargeload customers are guaranteed the same or better service under the new management.

Cold Comfort . . . Metalworking firms which customarily send part of their products to Canada for processing may not find much encouragement in new import-duty legislation scheduled for Congressional action as July ended.

A House-approved amendment would have prescribed levies against only the increased value of the product created by work done in a foreign country. The Senate, however, stuck by the present law,

Quote of The Week

Asked last week to comment on bills now pending in Congress to amend the anti-trust laws, Benjamin F. Fairless, chairman of the board, United States Steel Corp., said:

"I believe in the right of the individual businesman to compete in good faith on equal terms with a competitor regardless of the more favorable location of the competitor.

"I am not too familiar with the bills pending in Congress to amend the anti-trust laws, but I favor any measure which will clarify the right of the individual businessman to meet competition in good faith."

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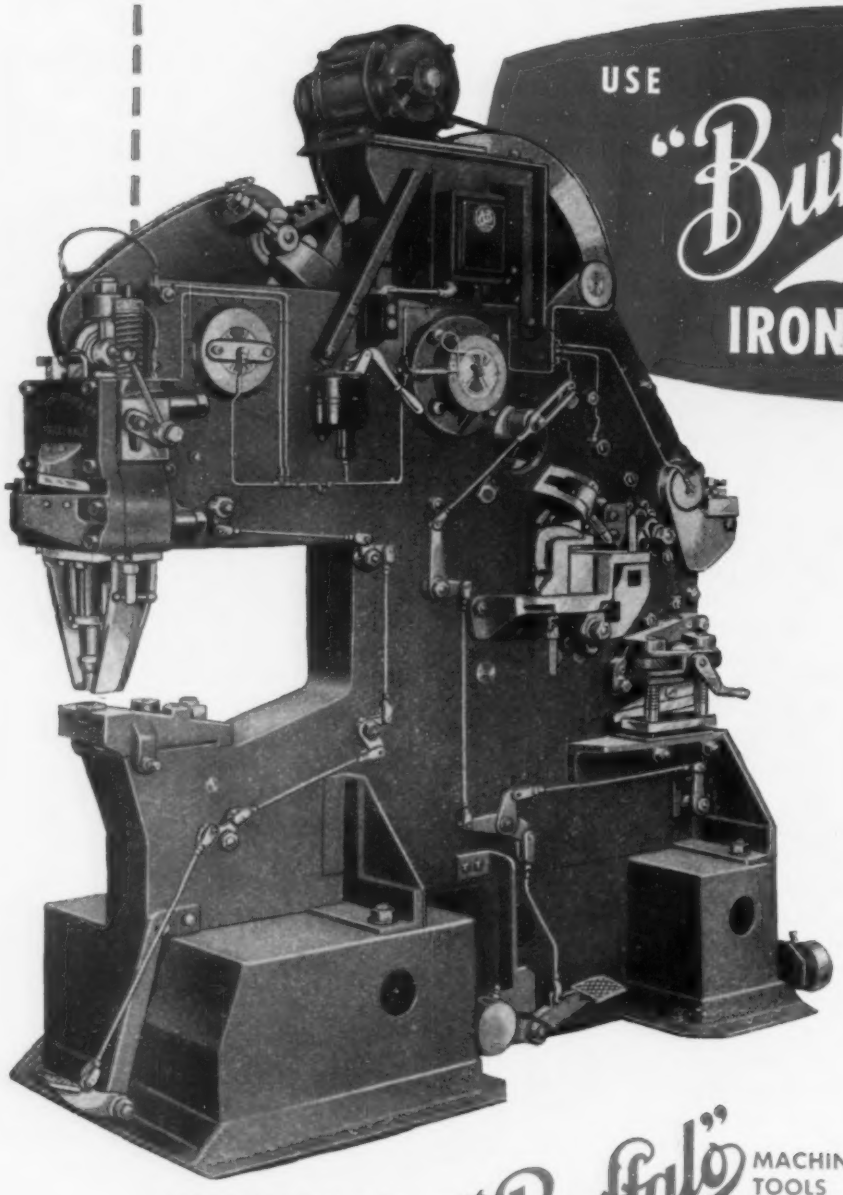
How to Get *Production Speed* INTO YOUR STRUCTURAL FABRICATION



USE "Buffalo" STRUCTURAL IRON WORKERS

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This new, higher capacity No. 1½ Structural Iron Worker punches standard beams, channels, angles, plates and flats—shears and miters angles — shears round, square, tee and flat bars — 90° notches and square copes angles and the flanges of beams, channels, tees—punches wide flange beams and channels in flanges or webs. WRITE FOR BULLETIN 3813!

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BUFFALO "Buffalo" FORGE COMPANY

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Canadian Blower & Forge Co, Ltd., Kitchener, Ont.

DRILLING PUNCHING CUTTING SHEARING BENDING

calling for duties on the total value of the article.

Both Sen. Homer Ferguson, R., Mich., and Sen. Charles E. Potter, R., Mich., gave strong backing to the amendment, but Sen. Eugene D. Millikin, R., Colo., argued that the effect of the measure would be to lower tariffs.

"This is not a tariff bill," he said. "This is a custom simplification or improvement bill."

Designed to make custom machinery easier to administer, the bill was returned to the House after the Senate vote. It does not call for changes in the classifications of any imported items.

Issue Supply Code Supplement

A newly-published supplement to the Federal Supply Code for Manufacturers presents about 7200 listings of firms now assigned code numbers by the Defense Supply Management Agency's Office of Cataloging.

The first revision to the basic listing of November, 1951, the new supplement lists new firms, revisions of earlier listings, corrections, and deletions. Copies of the 257-page revision are on sale at the Government Printing Office, Washington 25, D. C., for $1.25.

Reopen Manganese Plant?

Government manganese experts are debating whether or not to reopen the Westmoreland Manganese Corp. plant at Batesville, Ark. Final decision probably won't be reached until mid-August.

Defense Materials Production Administration officials say they intend to make a thorough study of the plant, and compare its present and projected facilities with the product demand from industry.

End Tungsten-Moly Allocations

Nickel is the only commodity remaining under free-world allocation this month, following termination of the International Materials Conference tungsten - molybdenum committee on July 31.

Previously, IMC recommended distribution allotments for both molybdenum and nickel, though the agency had proposed only guiding quotas for molybdenum in the July-September quarter. Need for formal allocations of this commodity was said to be at an end because of the improved supply-demand situation.

Construction:

Army Engineers to undertake projects in 35 states.

Federal construction projects in 35 states will be undertaken in this fiscal year by Corps of Engineers, using for this work a major share of the $421.6 million which Congress appropriated for Army civil functions.

Principal subdivisions of the total funds show $276.7 million for general construction activities; $79 million for operation and maintenance; $9.7 million for general expenses; and $2.8 million for surveys and studies. The seven-state Mississippi River and tributaries project received $51.4 million in construction and maintenance funds.

More than $1 million has been allocated for three special studies: Arkansas-White-Red River Basin; New England - New York Survey; and water levels of the Great Lakes.

No funds for deepening the Delaware River channel to Morrisville, Pa., are included in this year's appropriation, though the District Engineer's office earlier this year reported favorably on the proposed improvement. This recommendation has been approved by the Board of Engineers for Rivers and Harbors and has been forwarded to the states concerned—Pennsylvania, Delaware, and New Jersey — for comment and concurrence.

Social Security Tax Rise Likely

No move by Congress to head off the federal social security tax increase, scheduled to take effect on Jan. 1, was seen in Washington last week.

The tax deduction affecting employers and employees is slated to rise from 1.5 to 2 pct when 1954 opens. In addition, the rate for self-employed persons is supposed to become 3 pct.

Last week, Rep. Daniel A. Reed, R., N. Y., said he thought it "highly unlikely" that Congress would act to block the increase. Earlier Mr. Reed had been reported ready to introduce a bill to freeze the rates at their present position.

Commenting on the tax set-up, Mr. Reed said he is "not at all convinced" it is the best which could be created. He added, however, the implication that his House Ways & Means Committee would not recommend changing the schedule without making a thorough examination of the law.

A Ways & Means subcommittee, headed by Rep. Carl T. Curtis, R., Neb., is studying all types of social security problems. No report from this group is expected for months.

Construction Rate Stays High

The national construction rate continued at eight pct above last year during July, with a new monthly record of $3.3 billion worth of new starts reported to Bureau of Labor Statistics.

Total new construction expenditures for the first seven months of 1953 amounted to $19.3 billion, BLS reported. On a physical volume basis, the trend was also up.

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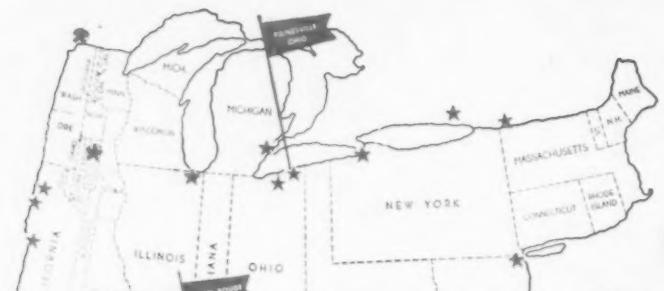
Announcing

TWO MORE

GENERAL CHEMICAL

Sulfuric Acid Plants



This strange-looking map of the United States visualizes the nation as it might appear if the size of each state were determined by the value its manufacturing concerns add to the nation's industrial output. It is based upon the figures appearing in the 1949 and 1950 Annual Survey of Manufacturers prepared by the U. S. Department of Commerce, Bureau of the Census.

Now! America's Foremost Producer Provides Industry with 20 *Sources of Supply*

As the nation's needs for Sulfuric Acid spiral steadily upward, General Chemical again adds more plants to its network of sulfuric production facilities in this country and Canada*.

Now, large new acid facilities are going up at Baton Rouge, La., and Painesville, Ohio, to serve expanded demands in those areas. These plants are an important part of the company's continuous, long-range development program aimed at providing Industry with convenient, dependable sources of supply for this vital basic chemical.

That's why—when you deal with General Chemical—you will be served not just by one plant, but through 20. Each augments the facilities and output of the others. Together they form a coast-to-coast "pipeline" that can supply your needs equally well, whether you operate in one location or several . . . from the Great Lakes to the Gulf . . . or from Massachusetts to California.

Just phone or write the nearest General Chemical office for further information on how General's Sulfuric facilities can best be put to work for you.

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Coast Aims at New Tinplate Records

Western steel mills hope to produce more tinplate than is imported from East for first time . . . Output should be over 485,000 tons . . . About 55 pct of needs—By T. M. Rohan.

The western steel industry last week appeared well on the way toward producing more tinplate than the area imports for the first time in recent history.

Combined output of tinplate by the expanded U. S. Steel mill at Pittsburg, Calif., and Kaiser's new Fontana mill was expected to hit at least 485,000 tons. This is about 55 pct of the western market of about 876,000 tons for tin mill products. Last year production was slightly over 320,000 tons.

Canneries Take Most . . . Bulk goes into food canneries representing about 15-20 pct of the U. S. market. At week's end a California cannery strike clouded the future as the season was about to hit full swing, but mounting government and farm pressure to prevent loss of the crop were expected to bring settlement this week.

U. S. Steel's mill this year will increase tinplate output about 10 pct from 300,000 to 335,000. Kaiser has shipped about 50,000 tons since September startup and expects to hit full production by the fourth quarter. Weirton, which with U. S. Steel eastern plants is the major outside supplier, expects 1953 shipments to equal 1952.

Traditionally conservative estimates by can company sources are for about 5 pct increase over last year. This would be about 8.5 billion cans compared to 8.1 last year in the three West Coast states. Additional tonnage goes to Hawaiian and Alaskan plants.

Push Differential . . . Western-made differential coated tinplate is getting its first big tryout. A healthy portion of this year's tomatoes, peaches and apricots will use it. But can companies are reluctant to try it on more corrosive foods such as asparagus, prunes and berries.

But western officials of American Can expect to strongly urge increased use of differential at annual planning meetings being held this week in the East.

U. S. Steel Columbia-Geneva Div. has made production runs on differential at Pittsburg. Kaiser has also produced but not shipped it as yet, and coating capacity is limited.

Some Reluctant . . . Weirton has found some can companies reluctant to take differential despite a price tag of 30¢ less per base box. Weirton has a $10 million Halogen acid type coater on the drawing boards for speeds up to 2000 fpm but production will not begin until 1955.

Can companies are also watching with interest a new small can making plant near Oakland. Put up by California Packing Co., a nation-wide packer with 47 plants, it is to supply buffet size cans for an adjacent cannery.

Bring Out Mothballs . . . While the Free World's largest shell case plant turned out its 15 millionth case since Korea with a slight assist, western ordnance men talked mothballs last week.

"You might call me a sort of journeyman unskilled laborer."

The Riverbank ordnance plant near Modesto, Calif., operated by Norris Thermador of Los Angeles last week made its 5 millionth case after only 9 months' operation. Coupled with the home plant output, it brought the total to 15 million since 1950.

Wilson Backs Plan . . . In San Francisco last week, Lt. Gen. L. H. Campbell (ret.), American Ordnance Assn. president, said western manufacturers are solidly behind the association's recently proposed mothball plan endorsed by Secretary of Defense Wilson. No cutbacks have been ordered on the high priority cases but Army sources indicated "a stretchout is possible."

Steel Baby Born . . . The West's newest and tiniest steel rolling mill had a lusty grip on life last week. And the city of San Jose, Calif., which has boomed industrially in late years, had its foot in the "mother of industries."

The latest addition is Western Rolling Mills at San Jose with a rerolling mill having 9 and 6 in. stands and a heating furnace. The firm already boasts a 60-day backlog and is on two shifts only a few weeks after its unheralded birth.

The mill rolls western carbon billets into ¾ x ¾ in. merchant bars, smallest on the Coast, and ½ in. sections. Estimated rating is 300 tons per month.

Can Compete . . . These merchant bars, according to Pres. Wm. Patapoff, formerly of Southwest Steel at Los Angeles, fit a unique economic niche since they are too small for economic rolling on large mills yet are widely used in metal furniture, cabinets, small conveyors, etc. The new mill is the sole western source, not competitive with any other western mills and able to undersell locally the major supplier to the West.

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SELECTION?
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TOUGHNESS?
MACHINABILITY?
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TOOL LIFE?
SURFACE FINISH?
LOW PRODUCTION?
HIGH UNIT COSTS?

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Drive for Civilian Replacement Sales

Korean truce convinces tool builders of need to concentrate on civilian requirements . . . But war orders are strong . . . Map sales effort—By E. C. Beaudet.

Signing of the truce in Korea has only served to convince machine tool builders that the time has come to concentrate on the civilian replacement market. Builders reflect the sentiment generally expressed by most businessmen this week when they say they would rather have it that way.

While admitting that defense spending will be lower than in 1951 and 1952, the industry believes military orders will still be substantial—as long as the international scene remains as perilous as it is at present.

Confusion . . . Many leading builders hope the confusion which has surrounded the Vance Plan will evaporate. If it does, chances are that there won't be a recurrence of hectic emergency demands. At the present time many people still don't know how much money has been allocated and exactly where it will go.

Although some $500 million was earmarked for the program during the Truman Administration that figure has since been cut in half by the Senate. Informed sources believe funds not yet appropriated should raise the total to $310 million.

But all of this won't be spent on long-lead time tools for the military. If any future mobilization is to be placed on a broad base, the balanced plant will be a pivotal objective. To achieve it, money will have to be spent for cranes, conveyors, jigs, fixtures, gages, heat-treating furnaces and other standard items.

These facts coupled with recent defense budget cuts all point to a return to civilian dollars.

Start Selling . . . National Machine Tool Builders Assn. held its 9th annual sales conference at Purdue University recently to outline strategy for a bell-ringing campaign. Some 156 sales managers and sales engineers forgot the heat long enough to agree that the 3-year period of order taking was over. The association's index of orders and shipments for the first half of 1953 clearly indicates that much.

Although new orders for June were up to 272.8 over the May mark of 246.4, there was no definite assurance that the downward trend of April and May had been halted. Builders who attribute the June increase to automotive buying think there is a good chance to keep the index from sliding.

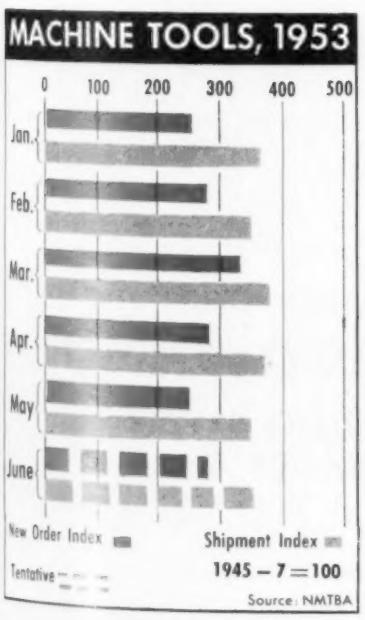
The optimists believe a movement is underway in Detroit to cut out some third shift work by increasing productivity. If it is true the program will take a lot of new machine tools.

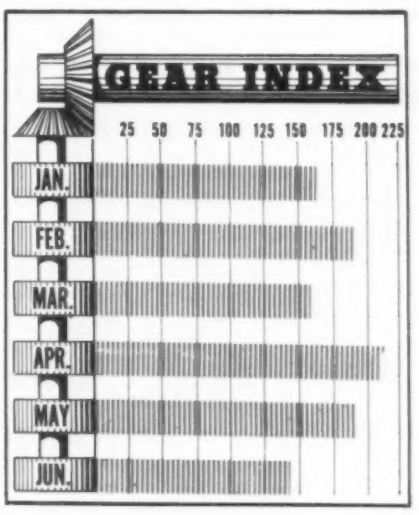
In any event Detroit has been a long range objective for many machine tool people for some time. Those not thinking in terms of immediate sales would like to help themselves by helping the Motor Capital reduce obsolescence. Rate of replacement in the auto capital has perennially been about 1 pct while industry generally boasts a 2 pct rate.

Too Much Capacity . . . Cracking the foreign market will be much tougher than making domestic sales. Index on foreign orders increased about 2 points to 16.4 in June but it is still roughly 10 points under the January mark of 26.3. Reasons for the drop aren't hard to find. American toolmakers say encouragement of American dollars has resulted in overexpansion of machine tool capacity in Europe.

A few claim the Europeans now have a capacity 3 times as large as the continent can normally support. In order to compete in the U. S. market some foreign firms reportedly are offering 5-year terms.

To meet this kind of competition head on U. S. firms will have to prove that initial cost of a machine is not the dominant factor. Sales engineers probably will emphasize the beauties of American machinery from the standpoint of cost per piece.





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Brownhoist Cranes save you man hours, production time and money. The patented Monitor Type Cab and Clear-Vision Boom give the operator unlimited visibility in all directions and help him turn out a greater volume of work in less time. Sound, rugged construction plus a simplified mechanism and easy accessibility to all moving parts help keep maintenance and repair costs low.

Brownhoist Cranes are built in capacities from 25 tons to 80 tons for virtually every heavy duty materials handling operation. For complete information, consult your nearest Brownhoist representative or write us today.

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166

REPORT TO MANAGEMENT...

Mild reaction to armistice

You probably reacted to the Korean cease-fire the way almost everyone did--with a feeling of quiet thankfulness that the shooting had stopped...But the truce had singularly little effect on the business pace...Headline-sensitive tin dropped 2c per lb, and the stock market eased off slightly but then steadied. Commodities, although slipping moderately, were virtually unaffected.

Truce effect discounted

Reason business and industry accepted the uneasy Korean settlement so calmly was that the armistice has seemed so near so often that most firms included this probability in their planning...Actually there was more excitement last March when a truce seemed possible than there was a week ago Monday.

Will continue expansion

Even final approval of defense cutbacks by Congress failed to create a stir as these too had been anticipated...And a survey by THE IRON AGE of major industrial areas (p. 103) showed no evidence that firms were thinking about tearing up expansion blueprints.

Too much stress on defense?

Consensus of industry's top executives is that it will be some time before manufacturers feel the impact of defense stretchouts --that perhaps the importance of military spending in a lot of industries has been overemphasized...Benjamin Fairless last week stated that only 10 pct of U. S. Steel's capacity is going "directly into military requirements."

Industry shows strength

Meanwhile, you could see many signs of industrial strength... General Motors announced it had produced a record total of 1,959,013 autos and trucks during the first half of 1953... Another giant, Westinghouse Electric Corp., said it had set a 6-month net sales record of $780,489,000 and had increased net profits 13.2 pct over a year ago.

Dividends rose 4 pct

You can add to the list of impressive earners; Reynolds Metals Co. which registered a net profit of nearly $10 million for the first half as compared with $6.2 million for the same period last year...The government reported that publicly released corporate dividends for the first 6 months of '53 amounted to about $4 billion, a gain of 4 pct from last year...Deposits in 528 mutual savings banks hit a record high of $23.6 million on June 30, a 15 pct increase from first-half '52.

Who gained top wage hikes?

Bureau of Labor Statistics said factory worker's earnings were up 22.5 pct since the start of the Korean War. Average weekly wage according to the most recent survey was $72.04, $13.19 more than at the time of Korean outbreak. Largest wage increases were in instrument, machinery, ordnance and primary metals industries where paychecks were upped as much as 28 pct.

Keep your eye on these . . .

Business indicators you should keep your eye on: June gear index was off 22.8 pct from May...Drop in farm prices is forcing farm equipment manufacturers to cut production and lower prices ...Employment in machinery manufacturing plants dipped for the third straight month.

Government may tap you

And don't be surprised if the government taps you for an opinion on what to do to prevent a recession. Questions might be on government loans, tax-amortization, policies, tax reductions. The Eisenhower Administration is pushing studies designed to work out an economic stabilization plan that would go into effect immediately if there were any signs of a recession. It's asking business and industry for help.

REPORT TO MANAGEMENT—REPORT TO MANAGEMENT—REPORT TO MANAGEMENT
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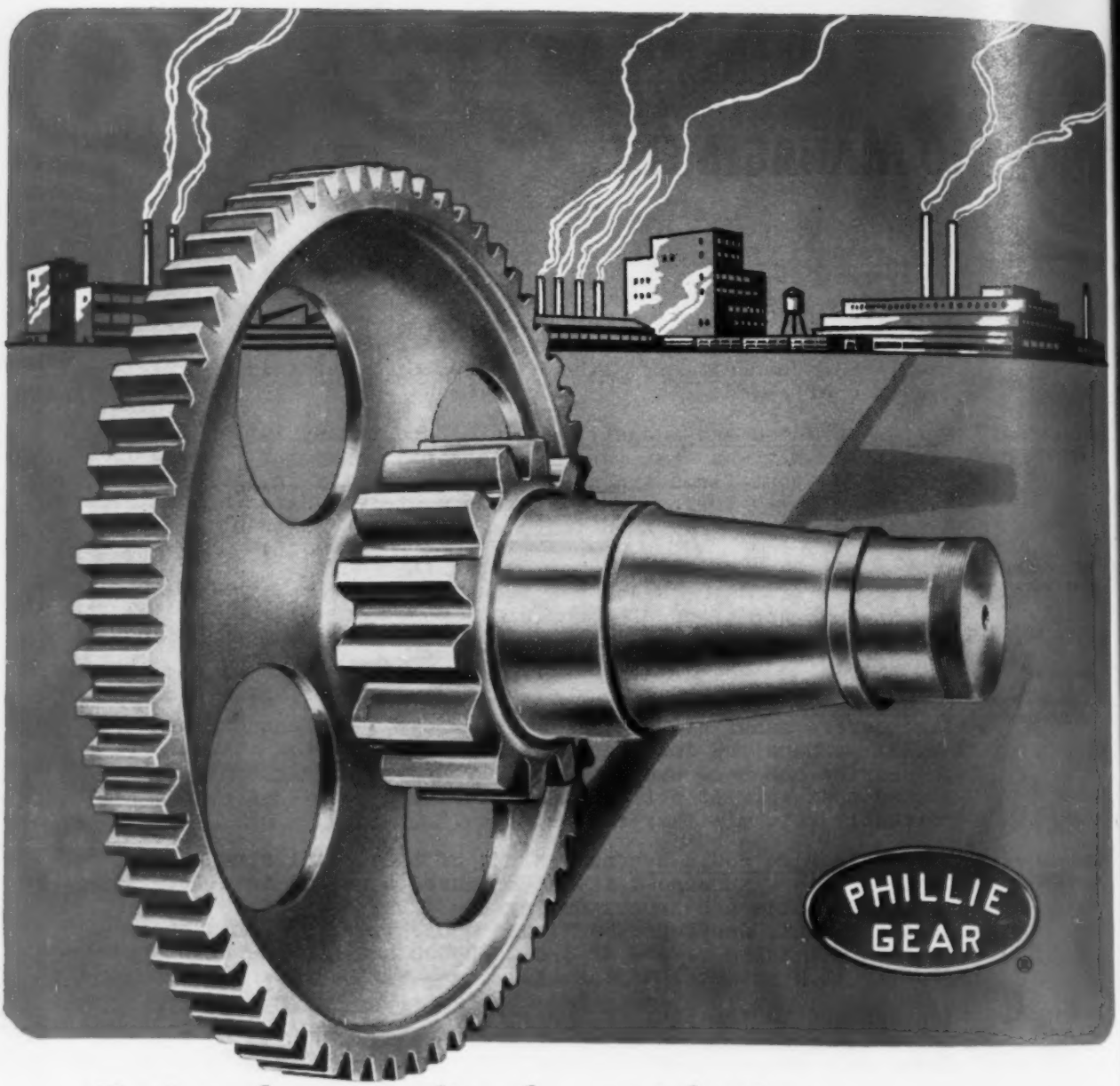

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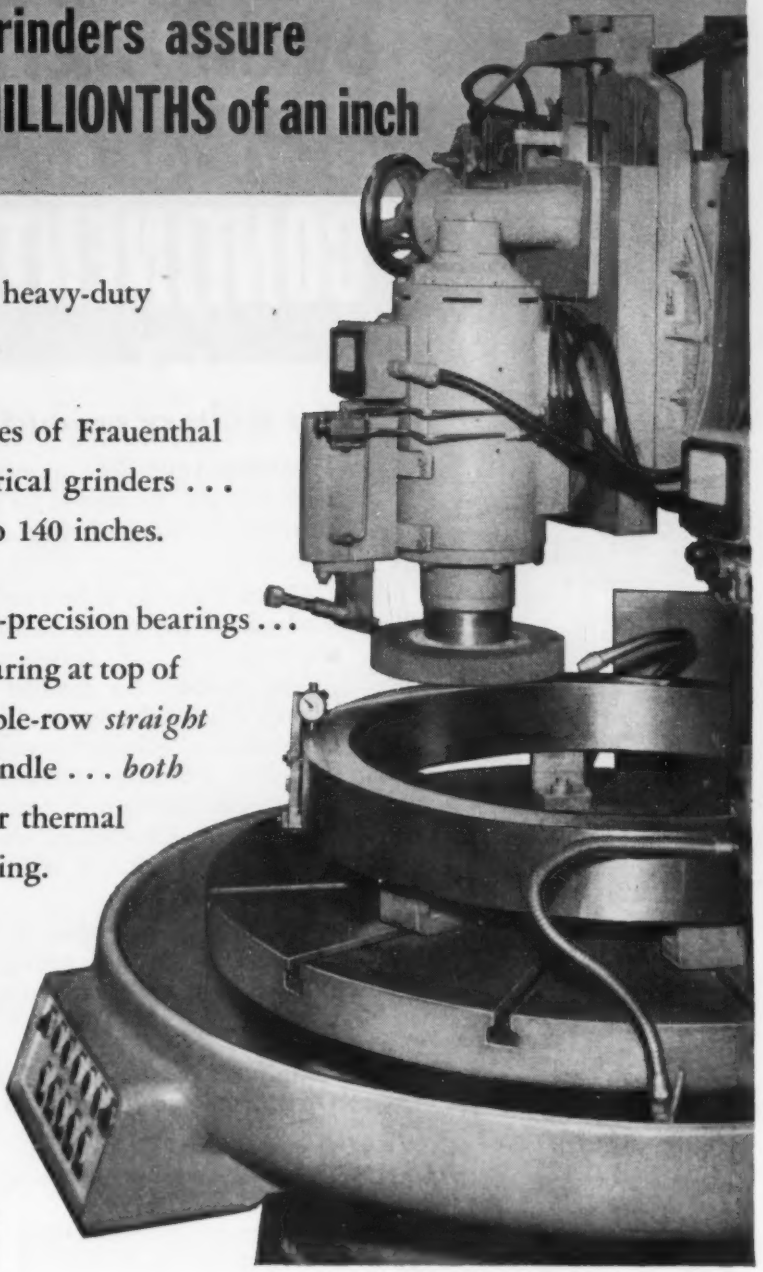

HOW? By use of KAYDON heavy-duty super-precision, pre-loaded bearings.

WHERE? In the table-spindles of Frauenthal Double-Head super-precision cylindrical grinders . . . table-sizes ranging from 30 inches to 140 inches.

WHAT? Two oversize, super-precision bearings . . . one is a double-row *tapered* roller bearing at top of table-spindle . . . the other is a double-row *straight* roller bearing at bottom of table-spindle . . . *both preloaded* and designed to allow for thermal changes without affecting upper bearing.

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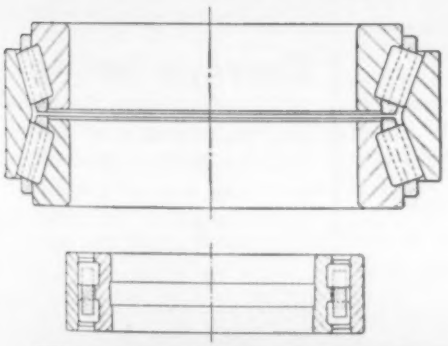
For over 10 years Frauenthal Grinders have been performance-proved on precision grinding of parts for aircraft, jet and automotive engines, tanks, gun mounts, radar units, Diesel parts, valves, large precision bearings and other precision parts and assemblies.

Cross section of both bearings



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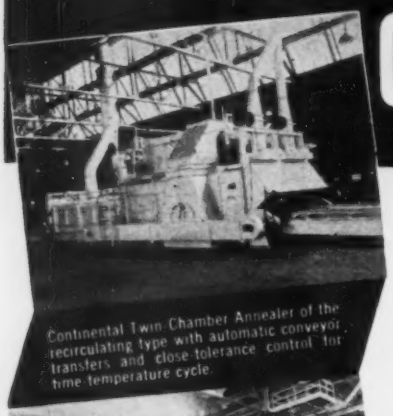
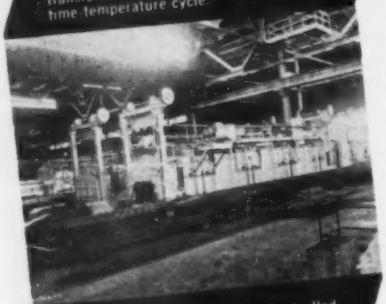


Continental Twin-Chamber Annealer of the recirculating type with automatic conveyor transfers and close-tolerance control for time-temperature cycle.



Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor systems.

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Turret lathes

South Bend Lathe Co.'s 16-in swi 2-H turret lathe which has a 1⅝-i spindle bore with a 1-in. collet c pacity is described in a new folde There are photographs of the lath in action and shots showing it main features. Attachments an accessories which add to the ver satility of the turret lathe are al included. *South Bend Lathe C*

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Testing machines

Complete details on Baldwin uni versal testing machines are con tained in a new circular. Each ma chine is built as a single unit wit its gage panel separately supporte by a framework which extends t the floor to prevent shock fro breaking specimens being trans mitted to the load indicator. *Bald win-Lima-Hamilton Corp.*

For free copy circle No. 14 on postcard, p. 1

Conveyor belting

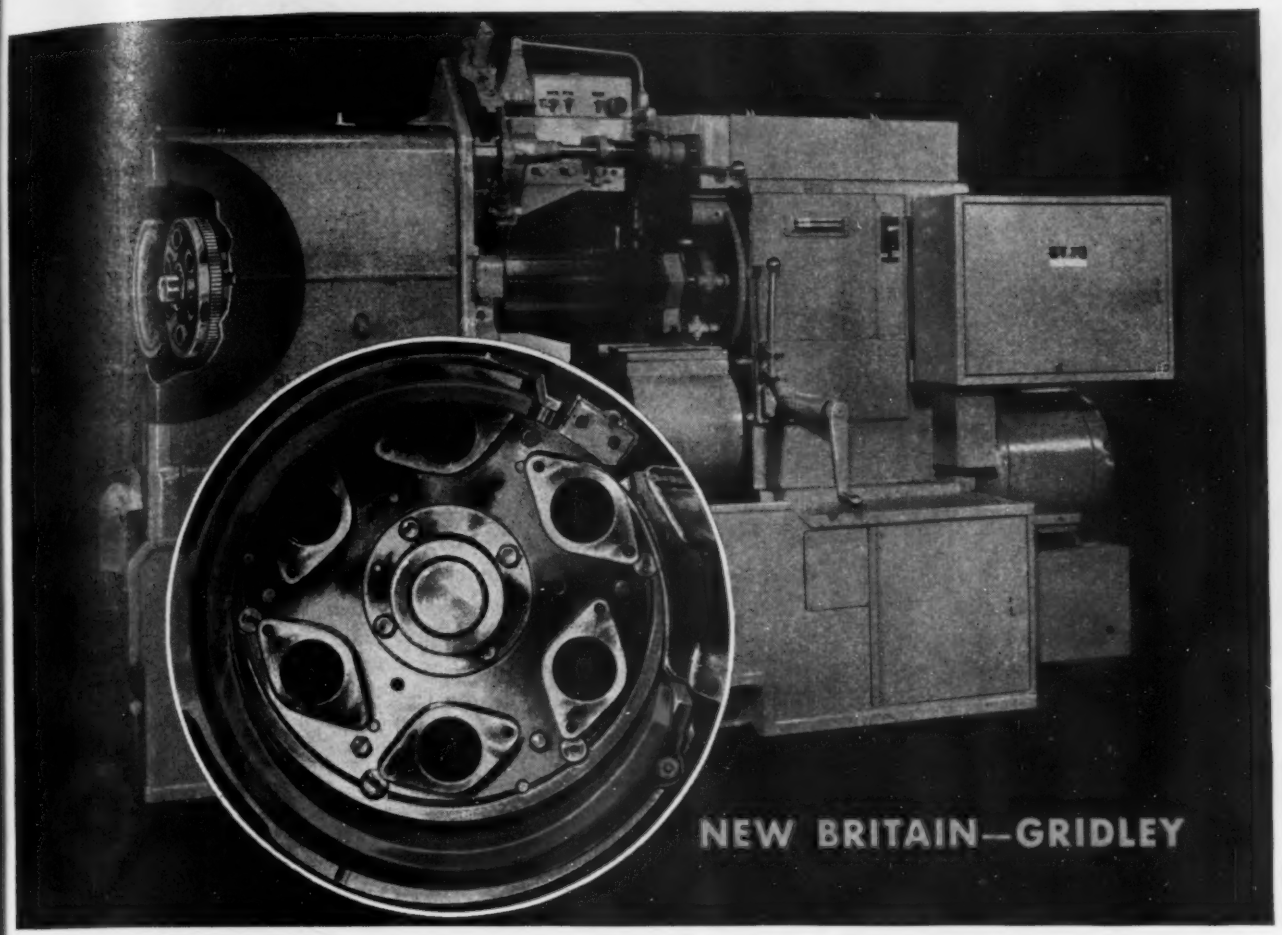
Information on the installatio and maintenance of conveyor an elevator belting is contained in new 32-p. manual published by Th B. F. Goodrich Co. More than 6 photographs and drawings are in cluded to illustrate ways to im prove belt service and to lengthe belt life. *The B. F. Goodrich Co*

For free copy circle No. 15 on postcard, p. 1

Save on taxes

For salesmen and others attend ing meetings and conventions Trip-Charge Inc. offers a fre booklet describing possible tax sav ings. Savings suggested cover ex penses such as gratuities, gifts an other costs occurring in connectio with travel. *Trip-Charge Inc.*

For free copy circle No. 16 on postcard, p. 1



CAST CENTRIFUGALLY for soundness and uniformity

And economy, too! N.B.D.'s ability to produce quality copper-base castings helps New Britain-Gridley keep permanent accuracy in its automatic screw machines.

This New Britain-Gridley six-spindle automatic screw machine is built to assure continuous production on the toughest jobs without the necessity of frequent adjustment or overhauling.

The function of the stock feed guard ring (shown above) made by National Bearing Division is to keep the six stock feed tubes in proper position while bar stock is being machined and the spindle carrier is being indexed. The stock feed tubes each have a spool which rides on the guard ring. Spindle speed on some machines reaches 2750 rpm. The spindles, indexed into six positions around the circumference of the ring, require close tolerances on the guard ring so that the bearing area will remain uniform.

National Bearing Division was entrusted with the production of this vital component because of its skill in producing centrifugal castings with high physical characteristics, in addition to the economies that could be realized through the purchase of a semi-machined part. National Bearing produces tool slide bushings for these same machines centrifugally cast to the same degree of accuracy and soundness.

If your product requires copper, bronze, or other copper-base castings, it will be worthwhile for you to investigate National Bearing Division. We produce copper-base castings, large or small, with any degree of finish, to precision specifications. And, because we are set up for production runs, we can probably save you dollars.

Write to National Bearing Division for complete information and your copy of our catalog.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4923 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

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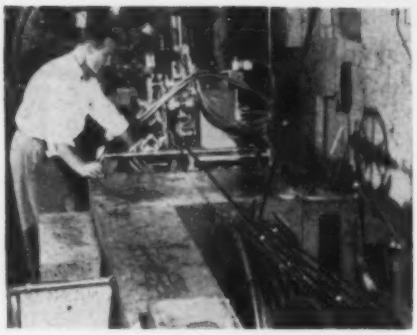
NEW EQUIPMENT

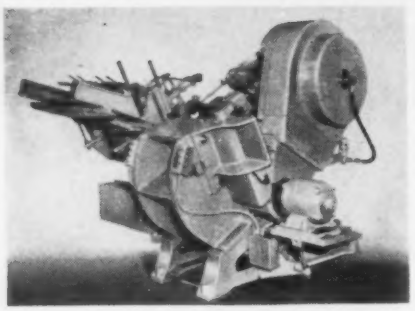
New and improved production ideas, equipment services and methods described here offer production economies . . . just fill in and mail the postcard on page 105 or 106.



At-a-glance length measurement of wire rope

Accurately calibrated wire rope makes at-a-glance length measurement possible. The rope is marked in colored bands at 5-ft intervals, as standard practice, but may be marked in feet or fathoms at any desired intervals for ready measurement. Marking is applied on a mass production basis to two top grades of wire rope, improved plow steel, and standard plow wire rope. Redi-Measured rope is marked in 20 dimensions of these grades ranging from ¼ to 1½ in. diam. Marked rope can be furnished in other grades on request. *Paulsen-Webber Cordage Corp.*

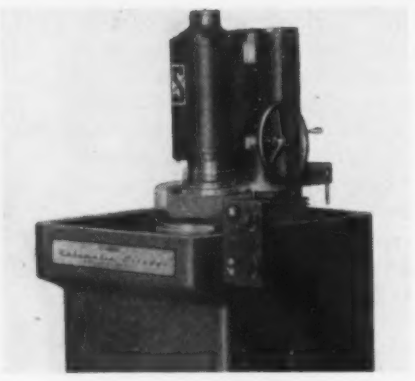
For more data circle No. 17 on postcard, p. 105.



Strip feed press rated at 25 tons capacity

The new Hamilton No. 401 strip feed press is a high speed production machine for light stampings. Continuous feed stack provides at least 1 hr production run before reloading. Features include improved frame design using welded steel structure which maintains perfect alignment without tie bars. Fawick Air-Flex clutch and brake directly on the crankshaft assures smooth starting, protection to crankshaft and dies, and practically instantaneous stopping. *Baldwin-Lima-Hamilton Corp.*

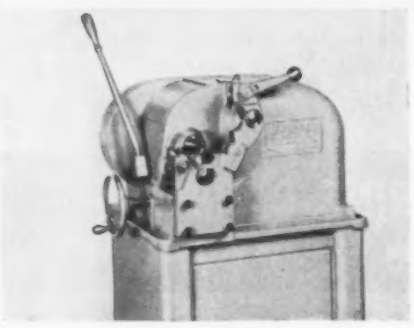
For more data circle No. 18 on postcard, p. 105.



Rotamatic surface grinder line is enlarged

This automatic high production machine is hydraulically and electrically controlled for a complete grinding cycle with automatic stop. The switch panel includes the start button, with separate optional control of grinder spindle, work spindle, coolant pump and optional energizing of magnetic chuck for wheel dressing. It is equipped with 7½ or 10 hp precision motorized grinding spindle having heavy end thrust construction; is arranged for Type 2 steel back grinding wheel, or segmental wheel chuck. Versatile variations of design arrangement and equipment serve multiple or single purpose high production grinding operations. Sizes are 10, 12, 14, 16, 18-in. *Standard Electrical Tool Co.*

For more data circle No. 19 on postcard, p. 105.



Tube flaring put on high production level

Powered tube flarer produces perfect, concentric, smooth-surfaced, 37° tube flares for use with standard Triple-lok and AN fittings. Flares meet the standards AN, JIC, SAE Hydraulic and ASME. The machine will flare the full range of standard tube wall thicknesses and all tube sizes from ⅛ to 2 in. OD. Annealed seamless copper, aluminum, steel and stainless steel tubing are handled with ease. With interchangeable heads and accessory attachments, the unit can be used for squaring-burring of tubes. *Parker Appliance Co.*

For more data circle No. 20 on postcard, p. 105.

Turn Page

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USE
FARRELL
-CHEEK
INDUSTRIAL
CHAIN
FARRELL-CHEEK STEEL CO.
MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS
FARRELL'S CARBON STEEL CASTINGS
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CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.
ELEVATOR, CONVEYOR PARTS
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HEAVY HARDWARE
Complete Line Wire Rope Fittings and Cutters, Bar Benders and Cutters.
GEARS AND PINIONS
"True Tooth" Gears and Pinions, Sheaves and Wheels.
RAILROAD CASTINGS
Locomotive and Car R. R. Specialty Castings.
STOKER PARTS
Feed Screws, Furnace Tools. Flanged Pipe, etc.
YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS
SANDUSKY, OHIO

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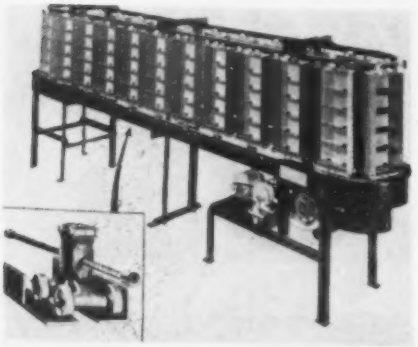


Table-cable conveyor offers unusual versatility

New table height, power driven cable conveyor has 4-wheel carriers attached to a ⅜-in. steel cable. Pallets, shelved trays, fixtures, rotators and other devices can be attached to the conveyor trolleys. The conveyor can be attached to load bars or out rigger roller frames for production, assembly or finishing operations. It can be inclined to higher elevations and floor or ceiling mounted. Trolleys run in formed steel channel track and can turn horizontal corners and through vertical inclines. Standard trolley spacing is 8, 12, 15 or 16 in. centers. *E. W. Buschman Co.*

For more data circle No. 21 on postcard, p. 105

Inspects five dimensions simultaneously

A multiple gage or Multichek inspects simultaneously five bearing diameters on a drive shaft, and indicates by means of lights whether or not the dimensions are within tolerance, oversize or undersize. It is equipped with three Airlectric gage heads for checking dimensions to tenths and two Electrichek gage heads for thousandths. Shafts can be inspected at a rate of 600 to 800 per hr at 100 pct efficiency. Minimum and maximum masters are used for the setup. No special skills are required as the operator places the part in the positioning fixture and slides the fixture forward into gaging position. When all dimensions are within tolerance, master light remains white; five signal lights black out. *Sheffield Corp.*

For more data circle No. 22 on postcard, p. 105.

Soldering irons have lifetime heating elements

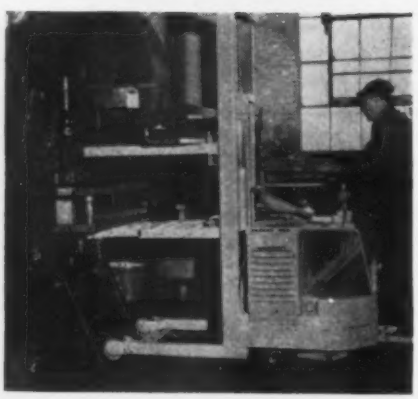
In a new type soldering iron, the Zeva, electrical heating elements are hermetically sealed into the cast aluminum head, eliminating need of replacements forever. The elements are fully guaranteed for the life of the tool. A large assortment of specially designed heads are available for almost any industrial application. Zeva irons range in sizes from 70 to 800 watts. *Paul C. Roche Co.*

For more data circle No. 23 on postcard, p. 105.

Positioning heavy parts for welding

Compact, rugged welding positioner for use with automatic welding machines has both table and tilt driven by a completely enclosed gear train. The Acme-powered tilt has self-locking gears and can be swung through 120° from the horizontal position. Limit switches are built in. Constant-torque table speed can be varied from 0 to 1½ rpm. Built-in dynamic braking eliminates coasting or over-running when the current is off. The table may be rotated through 360°, regardless of tilt position and table direction can be instantly reversed. To assure positive grounding, the table face has built-in collector disks (1000 amps). *Leader Welding & Mfg. Co.*

For more data circle No. 24 on postcard, p. 105.



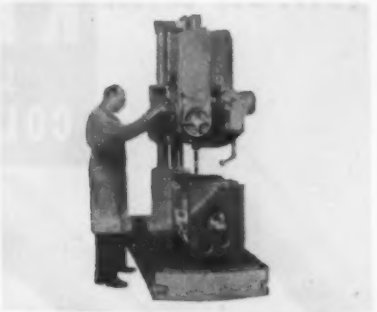
Tier lift truck services large presses with dies

In servicing large presses and other machinery with dies, jigs, etc. a new Load-Mobile tier lift truck cuts the downtime to a minimum. The operator of the machine secures his new die from the rack storage and places it on the top roller shelf. Then he proceeds to the press where he removes the old die onto the bottom roller shelf and replaces it with the new die. Extra handling is eliminated and only one trip is necessary. Gas-Electric drive allows for continuous operation of the machine. Three speed automatic control provides non-shock starting and running of the machine. Acceleration is predetermined and adjusted. Unit comes with all necessary equipment. *Market Forge Co.*

For more data circle No. 25 on postcard, p. 105.

Turn Page

MOVES FAST: STAYS PUT



Spindle is close to face of head, provides good work visibility while arm is low.

Head and arm design integrated to withstand torsion and compression with very low deflection.

Dovetail slide on arm secures head by clamping three finished surfaces together.

Positive tooth clutch between feed worm and gear box lets operator stop feed while spindle turns and tool gradually "unloads" thrust normally absorbed by arm.

Spindle accuracy and rigidity insured by four angular contact preloaded double zero ball bearings.

▶30 day delivery on most sizes.

9″ columns . . . 3′ and 4′ arms

11″ columns . . . 3′, 4′, and 5′ arms

Fast response to all controls with minimum effort, plus positive "no-drift" clamping, make it easy for Cincinnati Gilbert operators to get more work done accurately and on time. No one detail is responsible: it's the combination of "clean" design and rugged construction that makes Gilberts consistently pay high returns on your investment. 9″ and 11″ columns. Ask your Gilbert representative to demonstrate why "those who buy Gilbert buy Gilbert again."

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"SPECIAL PROCESSED"
COLD HEADING WIRE

When you use Keystone "Special Processed" Cold Heading Wire, you get uniform response every step of the way through forming, trimming, threading and final heat treatment.

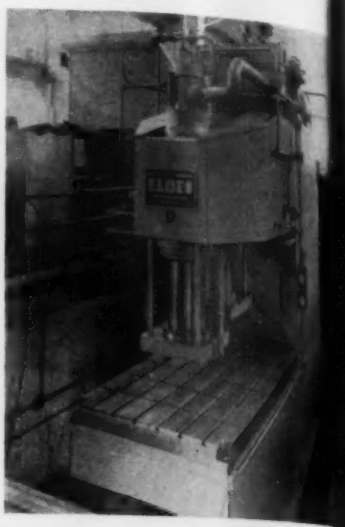
Uniform, strength-giving grain flow characteristics are clearly indicated in the above macrograph of a high-strength cap screw made from Keystone "Special Processed" C1035 Cold Heading Wire. The long, continuous fibres tell the "inside story" of efficient cold heading which results in longer die life, lower production costs and finished products of the highest quality.

INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

—New Equipment—

Continued



Flanging press

The Elmes 600-ton hydraulic C-frame press combines two 300-ton presses in one. The flanging press is so designed that both cylinder assemblies can be operated in unison, providing a total frame capacity of 600 tons, or each 300 ton cylinder assembly can be operated as an individual press completely independent of the other cylinder assembly. Power for each cylinder is supplied by an individual hydraulic pump. Either or both pumps may be operated depending on whether the press is being used as a dual ram press or as a single ram press. Control is provided through a single pendant station operating on a swivel. *American Steel Foundries, Elmes Engineering Div.*

For more data circle No. 26 on postcard, p. 165.

Soak tank cleaner

Oily soils, tars and soils of the type that can be cleaned in a degreasing solvent are removed by a new low-cost tank alkali cleaner. The rapid industrial cleaner can be safely used on aluminum, copper and other nonferrous metals. A water break free surface can be obtained with the cleaner which can be used at 150° to 212°F. For every 20° increase in temperature, cleaning speed is claimed to be doubled. The product is a non-dusting powder, packed in fiber drums. *Van Straaten Chemical Co.*

For more data circle No. 27 on postcard, p. 165.

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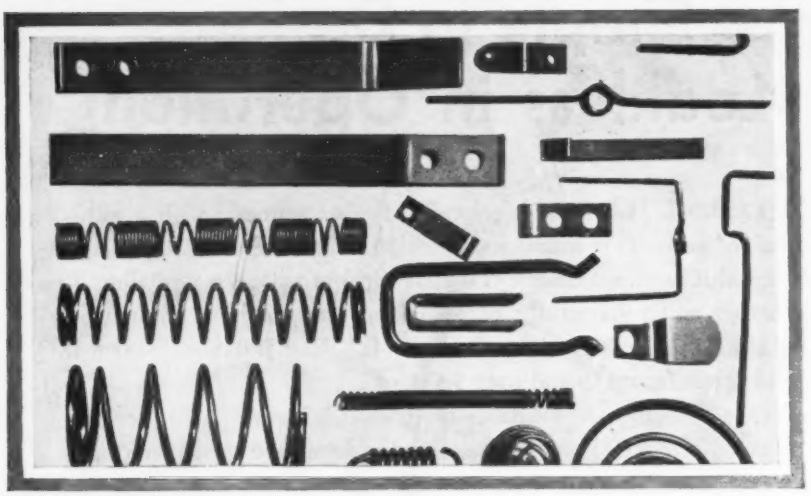
SEYMOUR PHOSPHOR BRONZE

THE METAL THAT RETAINS ITS RESILIENCE FOR YEARS AND YEARS AND YEARS

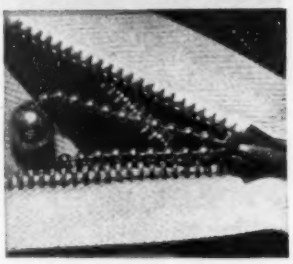


Ever since it was discovered, years ago, that a mere fraction of a percent of phosphorus in a melt of copper-tin bronze made it extremely tough, resilient and corrosion-resistant, *phosphor bronze* has been the "wonder metal" in industry.

Seymour Phosphor Bronze, in which these properties have been developed to a high point, is universally used for contact springs in electric snap switches, because such springs will "snap" hundreds of thousands of times without failure. This performance, plus the ability to function in salt air and gas-laden surroundings, makes Seymour Phosphor Bronze highly valuable elsewhere in industry.

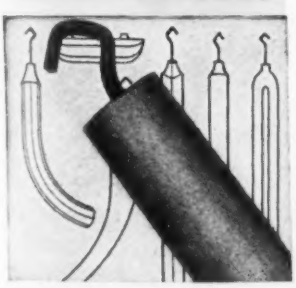
If you have a problem Seymour Phosphor Bronze might solve, our engineers are at your service, or we will send you samples for test. Made in sheet, wire and rod.

NICKEL SILVER



An alloy of copper, nickel and zinc. Silvery white, the perfect basis for flatware. Capable of a wide range of ductilities, therefore ideal for deep draws without anneals.

NICKEL ANODES



Seymour Nickel Anodes give even deposit with minimum sludge because the grain is precision-controlled during the melt, and each melt has laboratory supervision. Use them with Seymour Bright Nickel Bath wherever time is money!

SEYMOUR

Nonferrous alloys since 1878

THE SEYMOUR MANUFACTURING COMPANY
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Garlock "O"-Ring Seals

FOR ROTATING PUMP SHAFTS

A Sleeve Drive Balanced "O" Ring Seal

Simple in Design, Leakless in Operation

GARLOCK "O" Ring Mechanical Seals are made with a minimum of parts. This simplicity of design affords easy manufacturing adaptability of a Garlock "O" Ring Seal to withstand any liquid, whether mild, harmfully corrosive or extremely hazardous, on rotating pump shafts. The Garlock "O" Ring Balanced Seal will hold pressures up to and over 1000 p.s.i.

The "O" rings are available in "Teflon," Buna-N, Neoprene or Silicone. The metal parts contacting the liquid are available in any suitable metal.

On centrifugal pumps handling chemicals, petroleum products, edible liquids, pulp liquors, and many other liquids Garlock "O" Ring Mechanical Seals are giving outstanding service.

For positive sealing, easy installation and trouble-free service use Garlock "O" Ring Mechanical Seals on your rotating pump shafts. Write us about your sealing problems or contact your Garlock representative.

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GARLOCK

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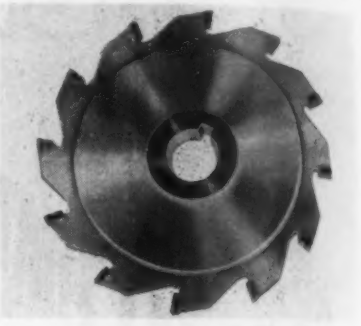
MECHANICAL SEALS
RUBBER EXPANSION JOINTS

New Equipment —— *Continued*

Slitting saws

New line of slitting saws feature heavily reinforced bodies to end shearing during stresses and to prevent shattering at high operating speeds. Tough and strong alloy



steel bodies are built out to the width of the teeth to minimize vibration, assure exceptionally true running, and provide finer finishes to closer tolerances. *Nelco Tool Co.*

For more data circle No. 28 on postcard, p. 105.

Portable riveter

New portable pneumatic riveter features rotating impact. This compact and balanced hand tool embodies the important advantages of the Airflex principle of spin riveting. Only a slight steady pressure is necessary for proper operation. The riveter tends to feed itself. The tool is said to permit quality riveting on short pilot run jobs, saves handling and setup time, speeds up production. Available in three sizes to handle 1/8 to 5/16-in. rivets. *Lemert Engineering Co., Inc.*

For more data circle No. 29 on postcard, p. 105.

Turn to Page 118

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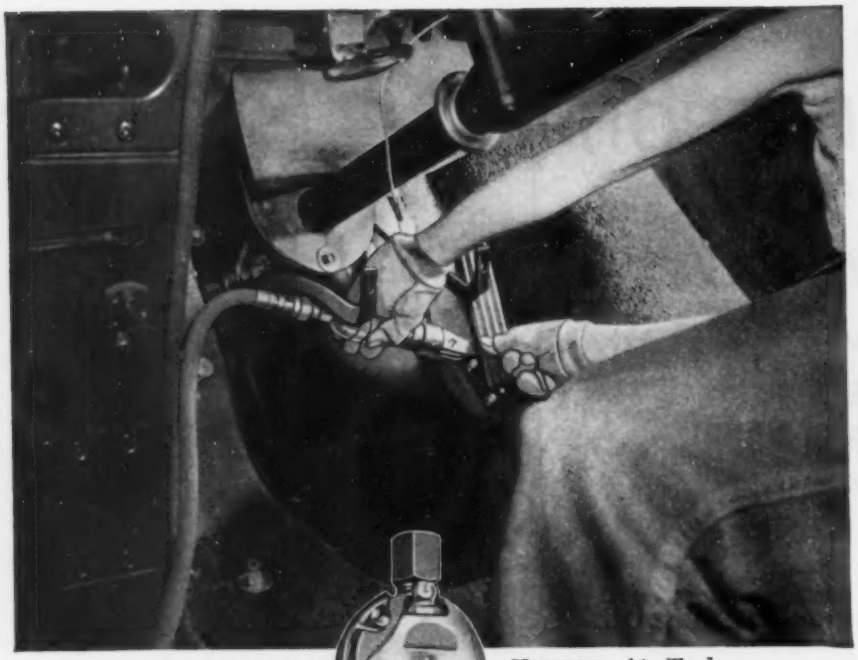


ANOTHER EXAMPLE OF *KELLER Air Tools engineered to industry*

KELLER Air Tools

for tightening hard-to-reach nuts

Some of the toughest jobs in industry suddenly become easy when Keller Ratchet Wrenches go to work. They are the *only* successful power ratchet wrenches ever devised (air OR electric), and they have eliminated some very tiresome jobs.

For instance, on the automobile assembly line shown above, where a Keller Ratchet Wrench is used for attaching the accelerator pedal.

Facts in Brief about Keller Ratchet Wrenches

Reaches into close quarters

Open-end design fits over hydraulic tubing and piping

Light weight and balance

Reduces operator fatigue

Can be used with built-in or detachable sockets

Simple operating mechanism

Send for literature and additional information on this unique **POWER** ratchet wrench

Keller Tool Company, Grand Haven, Mich.
Please send me additional information and specifications on the Keller Ratchet Wrench.

Name_____ Title_____

Company_____

Address_____

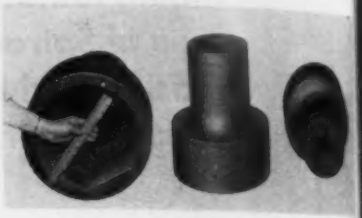
City_____ Zone___ State_____

New Equipment

Continued

Huge sockets

These three giant sockets are typical of the variety of straight sockets built for maintenance work on heavy-duty equipment of the type found in steel mills. The largest shown will accommodate hex nuts measuring 10⅝ in. across flats. The

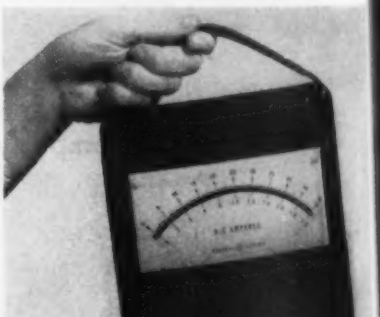


socket itself measures 21½ in. long, 14½ in. diam, and weighs 237 lb. A tiny socket accommodates hex nuts measuring 3/16 in. across flats, weighs 1 oz. The complete line of Apex sockets between these two extremes numbers more than 5000 stock sizes and types. *Apex Machine & Tool Co.*

For more data circle No. 30 on postcard, p. 105.

Portable meters

Two series of improved portable electric instruments indicate volts, watts, amps, and milliamps. The DP-11 is designed for general testing for electrical maintenance men who need a rugged, easily-read indicating instrument with an accu-



racy of ½ of 1 pct of full scale. DP-12 is designed for laboratory, field and production use. Accurate to ¼ of 1 pct of full scale, this instrument is suited to the maintenance of portable or switchboard instruments, control panels, and numerous production devices. *General Electric Co.*

For more data circle No. 31 on postcard, p. 105.

Molten steel unit

Field reports from steel mills using a new molten steel temperature-measuring unit indicate 50 pct faster readings and up to 1000 pct extension of the life of immersion thermocouples. The unit comprises a molten steel recorder and an instrument called a balance detector, an electronic detecting device. Utilization of the balance detector speeds up reading time to 10 to 15 sec. The unit signals the operator at the precise moment the maximum, or true reading is obtained. *Minneapolis-Honeywell Regulator Co.*

For more data circle No. 32 on postcard, p. 105.

Screen separator

A standard 24-in. diam foundry riddle is used on this medium size separator. It is operated by a ball bearing ac motor through a nylon eccentric bushing. Stroke of the

screen movement is adjustable from 0 to 1½ in. by loosening and tightening one bolt. Bronze bushings are used throughout. The machine measures 37 x 29 x 24 in. high. *Rampe Mfg. Co.*

For more data circle No. 33 on postcard, p. 105.

Track spikes

Steel packaging of track spikes offers economies to railroads at no extra cost over the wooden kegs. Inland's steel container weighs nearly 4 lb less than the wooden keg but holds the same 200 net lb of spikes. The container can be handled more readily by electro-magnet or manually, and can be stacked safely. *Inland Steel Co.*

For more data circle No. 34 on postcard, p. 105.

Turn Page

JOB-SIDE
Serves You
BEST...

Because Electro serves best at job-side, this procedure ought to serve your grinding wheel needs best too.

Whatever you desire to improve or accomplish . . . with any grinding or cutting-off operation . . . why not accept this suggestion: put your problem up to Electro at your job-side?

Under your actual working conditions Electro will demonstrate, with a wheel or wheels, for your specific-purpose, just what can be expected from a combination of what you know about your problem and what we can contribute in the way of improving or accomplishing what you desire.

Write, wire or phone us to send one of our technical experts to your plant for consultation, at no cost or obligation to you . . . and no sales pressure.
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CARDOX experience means dependable FIRE PROTECTION

When you buy fire protection, take a long, hard look into the experience of the people who plan and engineer it. It may mean your business survival—and the best way to judge is by what they've done!

CARDOX' experience in fire protection by low pressure carbon dioxide is on the record for all to see. For example, CARDOX Systems and Equipment* are protecting:

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Practically all U. S. jet engine test cells.
The world's first continuous seamless pipe mill.
A radio station 42 stories above Manhattan.
Precious records in a deep underground vault.
The world's largest rotogravure press.
Even the ingredients of a perfume producer.

The list could be expanded indefinitely. This broad "know-how" of CARDOX—based upon *thousands* of successful Systems, *plus* years of research-*is the priceless "extra" you don't pay for in every CARDOX System.* Why not write to see how we can help you?

**Covered by Patents, Issued and Pending.*

CARDOX

ORIGINATOR OF **LOW PRESSURE CO_2**

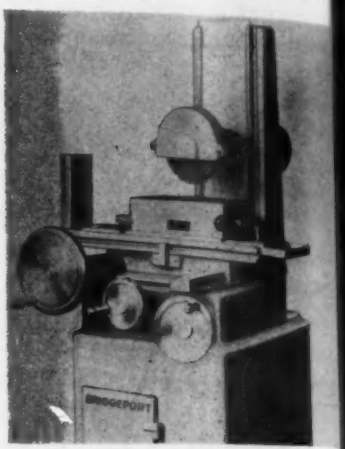
FIRE EXTINGUISHING SYSTEMS

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS

Offices in Principal Cities

Surface grinder

New 6 x 12 in. table size surface grinder is 13 in. under the wheel takes a standard 7 x ½ x 1¼ in. wheel. The machine has anti-friction ball and roller bearing motor ized Pope, Ex-Cell-O or Whitney

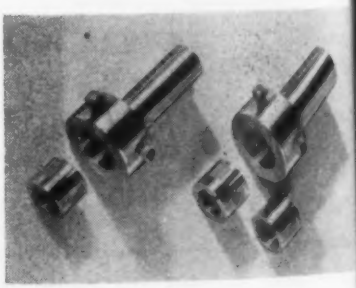


spindle, is hand scraped and well guarded against dust. It has V and flat ways. Its features are said to guarantee accuracy on all surface grinding jobs. *Bridgeport Grinding Machine Co.*

For more data circle No. 35 on postcard, p. 16

Tool adapter

New precision ground alloy steel tool adapter for Brown & Sharpe automatic screw machines effects savings in tool costs by affording broader use of smaller size automatic screw machine tools. With only two adapters in place of the con-

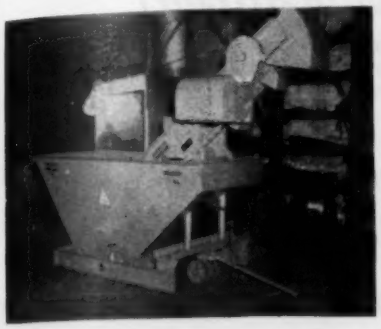


ventional six it is possible to use No. 00 tools on No. 0 machines and either No. 00 or No. 0 tools on No. 2 machines. Reduction to two sizes is accomplished by means of interchangeable self-locating bushings which are hardened and precision ground. *American Cam Co., Inc.*

For more data circle No. 36 on postcard, p. 16

Slag disposal unit

Foundry slag, granulated by dropping into a quenching tank supplied with circulating water, is conveyed and discharged into a cart or barrow by this portable unit. It is self-contained and can be placed in op-



eration the day received. Costly pits, foundations and installations are eliminated. It can be moved from cupola to cupola; is capable of handling slag produced by cupolas melting from 5 to 25 tons per hr. *American Conveyor Co.*

For more data circle No. 37 on postcard, p. 105.

Radial hole drill

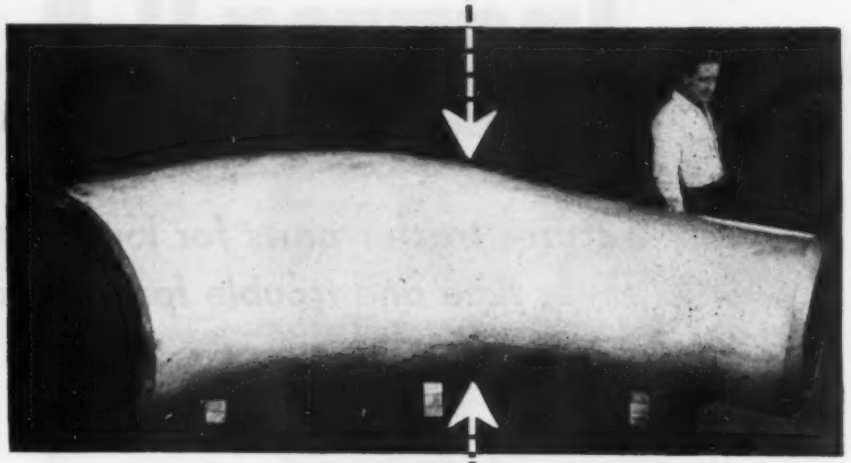
A standard machine eliminates building special machines for drilling radial holes in a variety of parts. Up to eight Govro-Nelson automatic drilling units may be employed, the units being movable

through 360° on the circular table and movable endwise on riser plates to meet requirements of the part being drilled. The machine may also be used with tapping units. It has a range of 1/32 to 3/8 in. on drilling operations; 0-80 to 3/8-16 on tapping operations. A single, momentary contact start button causes all units to operate simultaneously. *Govro-Nelson Co.*

For more data circle No. 38 on postcard, p. 105.

DURALOY

This Casting



Set a Record!

Casting weight
21,000 pounds

Shipping weight
14,000 pounds

Alloying Elements
38% Ni., 18% Cr., 2% Mo.

It's the weight rather than the Ni-Cr content that's the record.

We've cast many a piece with such a high Ni-Cr combination. But this represents the largest casting we have ever made. And it took careful scheduling of our entire battery of electric furnaces, with a double melt from two smaller furnaces.

Next followed a thorough X-ray for hidden flaws with our 400,000 volt unit. Then rough-finishing to specifications.

The significant fact is that this casting, the first of this size we have ever produced and destined for a most important high priority processing job, passed inspection with flying colors. *There was no reject here.* It is indicative of the skill of our metallurgists and foundrymen in turning out high alloy castings.

If you are looking for this kind of service, make Duraloy your casting source.

THE DURALOY COMPANY
Office and Plant: Scottdale, Pa. • Eastern Office: 12 East 41st Street, New York 17, N.Y.
Detroit Office: 2700 Woodward Avenue • Pleasant Ridge, Mich.
Atlanta: J. M. TULL Metal & Supply Co. Chicago: F. O. NELSON 332 S. Michigan Avenue
METAL GOODS CORP. Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

UNIVERSITY OF MICHIGAN LIBRARIES

Acme Steel Strapping Insures S.A. *(Safe Arrival)*

Secures tractor parts for long-distance hauling . . . saves time and trouble for International Harvester

STRAPPING ON A TRACTOR. When International Harvester ships crawler tractors on open railroad flatcars, Acme Steel Strapping ties tool boxes, lubrication equipment and seat cushions in place for the journey.

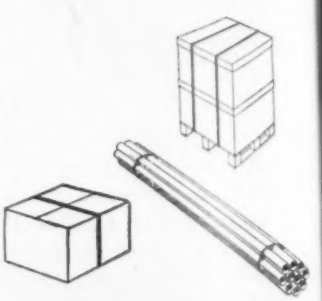
SOLE SUPPORT for these IH Diesel engines is one Acme Steelstrap per engine. It secures the engine to a pallet for easy handling.

4,000 POUNDS of tractor dashboards are bundled together with Acme Steel Strapping for delivery from one International Harvester plant to another.

Whenever you receive anything secured with Acme Steel Strapping, you know that the shipper has taken care to get it to you safe. He has also beat the threat of damage-in-transit and has cut the cost of packing and shipping, too.

Acme Steel Strapping does all these things. It makes packing and loading easier and faster. It provides better protection during shipment, and helps insure S.A. (Safe Arrival).

Almost certainly, Acme Steel Strapping or Acme Steel Stitching Wire methods can help somewhere in *your* operation. If you have any kind of a shipping or materials-handling problem, we may have just the idea you need. Write Acme Steel Products Division, Dept. IA-83, ACME STEEL COMPANY, 2840 Archer Avenue, Chicago 8, Illinois.



ACME STEEL

STRAP IT . . . STITCH IT . . . SHIP IT . . . SAFELY!

The Iron Age

SALUTES

Wallace F. Ardussi

Fellow members of the stamping industry say he has what it takes. They picked him to head PMI.

AN old head, young shoulders and an optimistic outlook sound like a personality portrait taken from fiction. But stamping executives from all over the country swear the description fits Wally Ardussi to a T.

The genial golfing whiz who owns and operates Cleveland's Variety Stamping Company has done a great many things in his 47 years to earn the accolade.

Wally was born in Saginaw, Michigan, and graduated from the University of Michigan with a chemical engineering degree. His wife says Wally wasn't satisfied with completing the toughest course on the campus. He had to go back as a post graduate student for a mechanical engineer's degree and 2 years of law.

Before taking over as president of PMI last fall Wally established a solid business background in sales and engineering through association with Chrysler Motors, Foote Brothers, Industrial Rayon Globe Stamping Div. of the Hupp Corporation, and of course his own firm.

Ownership of a fast growing stamping plant hasn't kept Wally from being active as a member of The Society For Automotive Engineers, American Society for Metals and the American Society of Tool Engineers.

Friends say he is too busy to actually spell out a business philosophy. He just gets today's work done and remains supremely confident about the future of business in America.

In addition to playing a fine game of golf Wally manages to keep pace with three husky sons during leisure hours.

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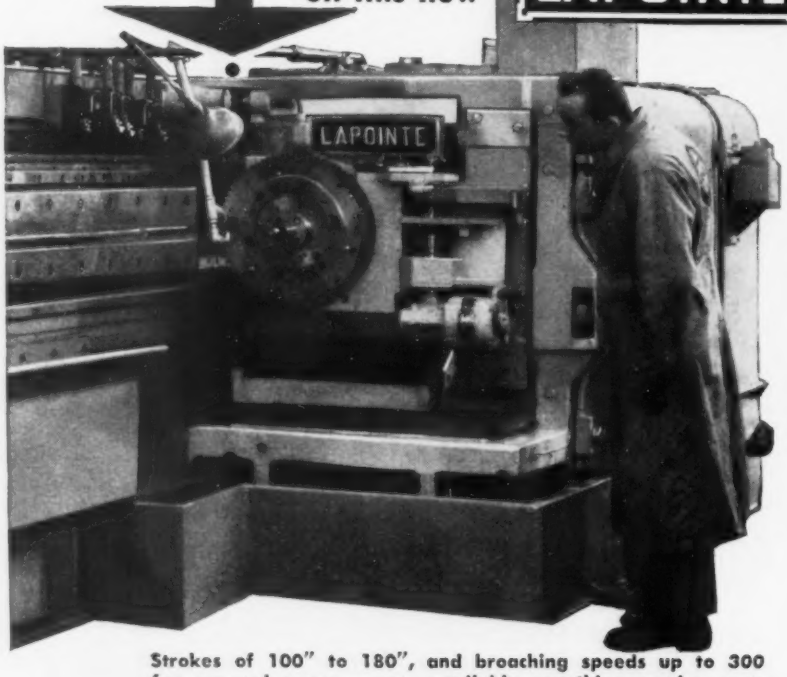
here's a test you can make

with a quarter

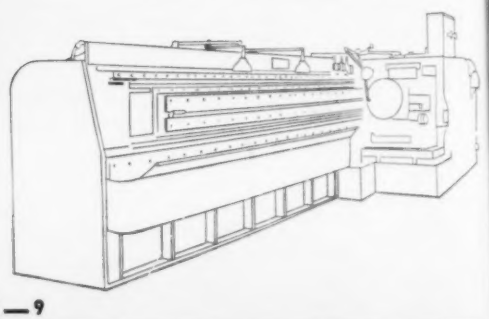
- Stand a quarter on edge directly over the spot where the BROACHING is taking place;
- remove all the required metal on a TURBINE DISC; go through the automatic cycling — repeatedly;
- *your quarter will still be standing!*

on this new **LAPOINTE** ELECTRO-MECHANICAL DRIVE horizontal

BROACHING MACHINE



We eliminated vibration by the very weight and massiveness of this machine! Constant chatter or vibration at the cutting edge of any tool will materially shorten the life of the tool. *Eliminate vibration and you multiply the life . . . six times . . . eight . . . or even ten times!*



Strokes of 100" to 180", and broaching speeds up to 300 *fpm* — and more — are available on this amazing new LAPOINTE machine. Complete details are given in our Technical Bulletin, sent promptly on request.

Ask for Bulletin S·R·H·E — 9

LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

The Iron Age

INTRODUCES

C. B. Smythe, elected president, THE THEW SHOVEL CO., Lorain, Ohio.

Paul J. Leonard, elected president, WAGNER MFG. CO., Jackson, Mo.

H. S. Harrison, elected vice-president—Finance, THE CLEVELAND-CLIFFS IRON CO.; **J. H. Kerr,** elected vice-president—Law; and **J. S. Wilbur,** elected vice-president—Sales.

Stanley E. Ridderhof, promoted to vice-president, ROSAN INC., Newport Beach, Calif.

Merrill Cox, elected vice-president, Metals Div., Administration and Sales, ARTHUR G. McKEE & CO., Cleveland; and **A. L. Foell,** elected vice-president, Metals Div., in charge of engineering.

H. V. Stehl, appointed vice-president and general sales manager, INLAND STEEL PRODUCTS CO., Milwaukee.

F. E. Amon, named vice-president in charge of sales, PARKER AIRCRAFT CO., a Los Angeles, a wholly owned subsidiary of the Parker Appliance Co., Cleveland; **R. J. Trivison,** elected vice-president in charge of manufacturing; and **Warner B. McCarthy,** elected secretary-treasurer.

George E. Lott, elected vice-president, TREVOR STEEL CO. Centerline, Mich.

James D. Nisbet, appointed director of research and development, THE UNIVERSAL-CYCLOPS STEEL CORP., Bridgeville, Pa.

Carl Persson, appointed assistant chief engineer, Machine Design Engineering Dept., ACME STEEL CO., Chicago; and **Hugo H. Gustafson,** becomes assistant chief engineer, Production Engineering Dept., Riverdale plant, Riverdale, Ill.

R. Wain Bowman, appointed director of sales, ALUMINUM INDUSTRIES, INC., Cincinnati; **John Magee,** appointed manager of industrial sales, midwest region; **George Graman,** made plant manager; and **Lyle B. Paris,** will continue as sales manager.

Thomas E. Lloyd, named director of sales, SALEM-BROSIUS, INC., Pittsburgh; **John W. Holaworth,** appointed sales manager, Industrial Products; and **C. L. Kerr,** becomes combustion engineer. **E. T. Trebilcock** and **R. B. Powers** have been named sales engineers of steel mill heating furnaces and heat treating equipment.

Don A. Lawless, becomes assistant director, Metallurgical Dept., SAM TOUR & CO., INC., New York.

Joseph A. Sonia, Jr., appointed chemical engineer and group leader in process study, HOOKER ELECTROCHEMICAL CO.; **Robert B. Brautigam,** appointed chemical engineer in process study and **Walter T. George,** appointed chemical engineer, Operations Dept.

Henry J. Barten and **Dr. Eric F. Lype,** promoted to senior engineers, Propulsion and Structural Research Dept., Armour Research Foundation of ILLINOIS INSTITUTE OF TECHNOLOGY.

William G. Hill, named a sales engineer, New England, Electro Dynamic Motor & Generator Div., GENERAL DYNAMICS CORP.

Milton Paisner, appointed district sales engineer, AMERICAN SILVER CO., INC., Flushing, N. Y.

Charles F. McElwain, has been appointed to the staff of the director of engineering, INTERNATIONAL BUSINESS MACHINES CORP., New York.

I. MELVILLE STEIN, elected president, Leeds & Northrup Co., Philadelphia.

JAMES J. STRNAD, becomes president, Lempco Products, Inc., Bedford, Ohio.

ALBERT B. HARDING, becomes president, Lempco Automotive, Inc., wholly owned subsidiary of Lempco Products, Inc.

UNIVERSITY OF MICHIGAN LIBRARIES

Personnel

Byron B. Burd, appointed metallurgist, DAMASCUS TUBE CO., Greenville, Pa.

A. C. Hillman, appointed special consultant, KELITE PRODUCTS, INC., Los Angeles.

Robert S. Sagers, appointed manager, New England District, KENNAMETAL INC., Latrobe, Pa.

Charles A. Shenberger, appointed manager of rolled ring sales, HEPPENSTALL CO., Pittsburgh.

Gerald R. Gonyer, appointed manager, Chicago office, FARREL-BIRMINGHAM CO., INC. He succeeds Harry D. Temporal who will retire Sept. 1.

John J. Murphy, appointed manager of defense projects, HUDSON MOTOR CAR CO., Detroit.

J. P. Schott, appointed manager, Louisville Branch, WHEELING CORRUGATING CO., Wheeling, W. Va. He succeeds E. G. Hillman, who retired Aug. 1.

Dr. D. Gardner Foulke, appointed manager of electrochemical development, HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.; and **Harold R. Smallman,** assistant vice-president assigned to handle all west coast affairs.

Earl J. Phillips, appointed district manager, new Chicago office, STERLING ELECTRIC MOTORS, INC., Los Angeles.

William M. Steffen, appointed general supervisor of materials and process engineering, NORTHROP AIRCRAFT, INC., Hawthorne, Calif.

Harold V. Bailey, becomes sales manager, Screw Machine Dept., GREENLEE BROS. & CO., Rockford, Ill., succeeding Ed Kelly who has retired.

Jack L. Modrich, becomes general sales manager, MECHANICAL AIR CONTROLS, INC., Detroit; **Edward L. Rodgers,** appointed chief engineer; and **Larry Newton,** appointed purchasing agent.

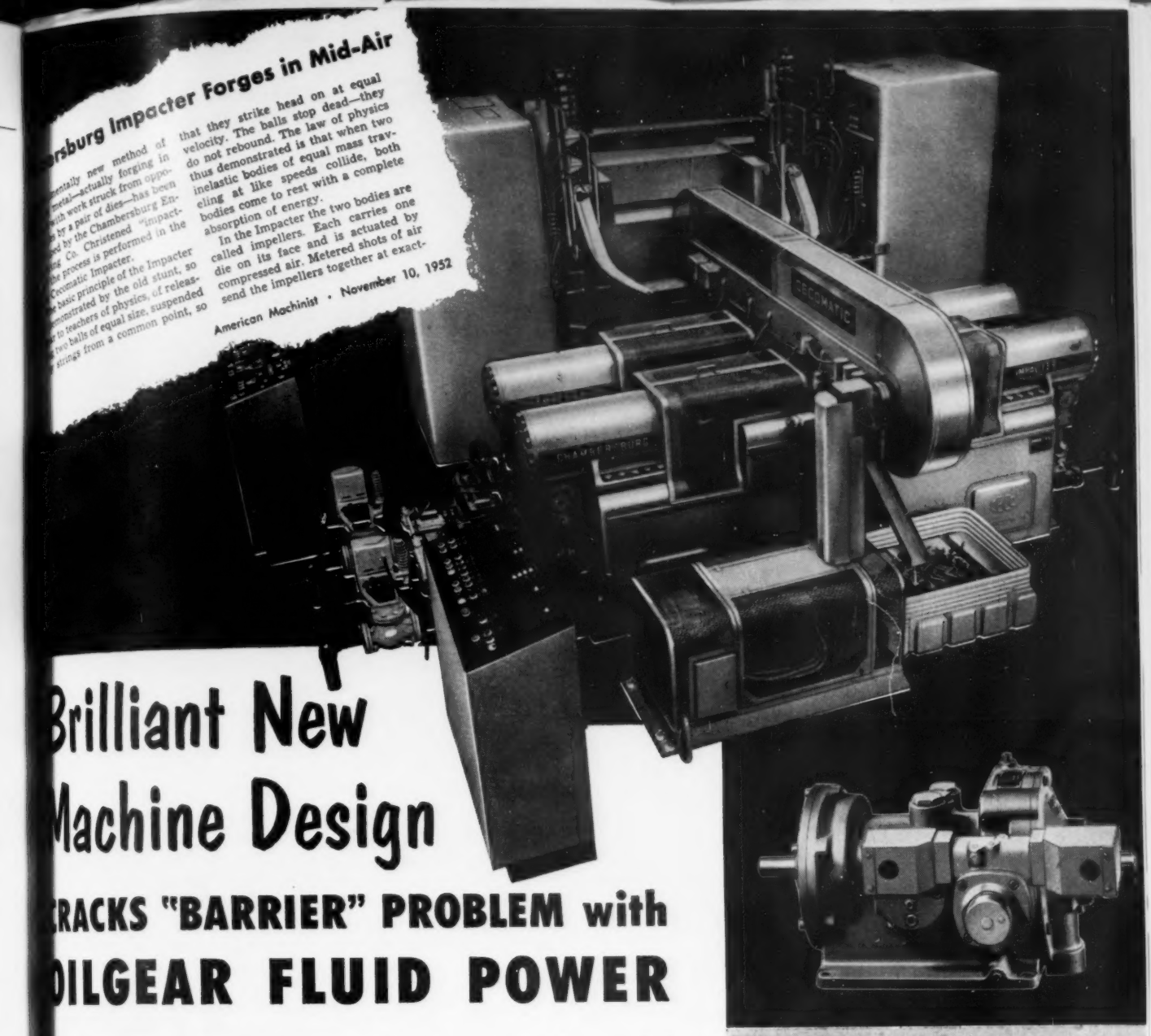
WM. J. BLAZEK, becomes president, Evans Reamer & Machine Co., wholly owned subsidiary of Lempco Products, Inc.

M. W. TOWNSEND, appointed assistant to the president, Handy & Harman, New York.

W. L. SHEFFIELD, appointed chief engineer, Lewis - Shepard Co., Watertown, Mass.

DONALD S. MYERS, appointed industrial sales engineer, Pittsburgh, Surface Combustion Corp.

• Ruggedly made to withstand severe use . . . advanced designing in fan blades . . . rigidly mounted and securely locked in place . . . well balanced and readily portable by overhead crane or auxiliary truck. Stationary and oscillating types with either pedestal (floor mounting) or bracket (wall mounting).
B. F. Perkins & Son, Inc.
HOLYOKE, MASSACHUSETTS
Manufacturers of Industrial Machinery Since 1873
PERKINS
MAN COOLERS
TRADE MARK REGISTERED UNITED STATES PATENT OFFICE



...rsburg Impacter Forges in Mid-Air

...ntially new method of ...metal—actually forging in ...with work struck from oppo... by a pair of dies—has been ...ed by the Chambersburg En... ...ing Co. Christened "impact... ...the process is performed in the ...Cecomatic Impacter. ...e basic principle of the Impacter ...monstrated by the old stunt, so ...r to teachers of physics, of releas... ...two balls of equal size, suspended ...strings from a common point, so that they strike head on at equal velocity. The balls stop dead—they do not rebound. The law of physics thus demonstrated is that when two inelastic bodies of equal mass traveling at like speeds collide, both bodies come to rest with a complete absorption of energy.

In the Impacter the two bodies are called impellers. Each carries one die on its face and is actuated by compressed air. Metered shots of air send the impellers together at exact-

American Machinist · November 10, 1952

Brilliant New Machine Design

...RACKS "BARRIER" PROBLEM with OILGEAR FLUID POWER

...nce the "forge-it-in-mid-air" ...dea occurred to the Chambers... ...urg Engineering people, there ...ere two "barrier" problems to be ...mashed before the idea became a ...rilliant reality. Something of the ...eriousness of the problems is in...dicated by the fact they spent 10 ...ears to get the right, precise in...egration of movements and forces ...equired.

One problem, that of getting the ...lanks to be forged into the right ...lace at the right time for the mid...ir forging blow, was eventually ...olved by recourse to *Any*-Speed Oilgear Fluid Power. The ...tandard totally enclosed Oilgear ...ransmission with integral ...lectro-hydraulic control gave the ...esigners of the Cecomatic Im...acter remote, interlocked, precise ...ontrol of the conveyor . . . quick, ...ushioned acceleration . . . high ...raverse speed . . . fast, cushioned ...eceleration . . . smooth stop and ...well in forging position; all at the speed and accuracy they needed . . . just as so often in the past Oilgear has given *other* machine designers what *they* wanted.

Maybe your problem can be solved, your machine's performance improved by the smooth, swift acceleration and deceleration of the *Any*-Speed Oilgear. Maybe you need its extreme precision of controllability . . . or any of a dozen other remarkable characteristics. In addition you get simplicity, ease of assembly into your machine, ruggedness, dependability, accessibility, a unique freedom from maintenance.

But whatever your need, *you have not exhausted all possibilities in machine design if you have not investigated Oilgear Fluid Power Pumps, Motors and Transmissions exhaustively.* You too may have a world beater in your hands. THE OILGEAR COMPANY, 1581 W. Pierce St., Milwaukee 4, Wis.

Cecomatic Impacter doubles, triples, quadruples—octuples forging production! No jar or vibration. Less metal stress and die wear. Blanks load into conveyor automatically. And automatically the Oilgear type AXB-33 Variable Speed Transmission accelerates conveyor swiftly, smoothly, it smoothly stops with forging blank "dead on target," waits for the forging blow, then accelerates forged part away and new blank into position. Oilgear is adjustable up to 40 cycles per minute, is easily set to any required index distance which is then maintained under complete automatic control with unvarying precision.

OILGEAR

OILGEAR

UNIVERSITY OF MICHIGAN LIBRARIES

ELECTRO DYNAMIC

Extra dependable

OFFICIAL U. S. NAVY PHOTO TAKEN OFF OAHU, HAWAII

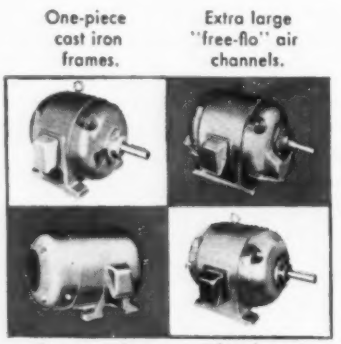
UP FROM THE SEA comes fabulous Motor Stamina for Industry!

Over half a century of service aboard U.S. Navy submarines — *where dependability means life itself* — has bred tremendous stamina into ELECTRO DYNAMIC industrial motors. This inheritance of *extra dependability*, proved during years of gruelling duty under the sea, explains the amazing performance records being established by E.D. motors in industry today.

From 1 to 250 h.p.

(N. E. M. A. STANDARDS)

WRITE TODAY FOR CATALOGUE NO. 867


One-piece cast iron frames.
Extra large "free-flo" air channels.
Permanently aligned cast iron brackets.
Liberal size grease lubricated bearings.

Also a complete line of Direct Current motors and generators

ELECTRO DYNAMIC

DIVISION OF GENERAL DYNAMICS CORPORATION

BAYONNE, NEW JERSEY

—Personnel—

Continued

Paul L. Swoger, named midwestern sales manager, AMERICAN METALLURGICAL PRODUCTS CO., Pittsburgh.

Richard M. West, promoted to advertising manager, THE OSBORN MFG. CO.

Donald C. Sprowls, appointed division credit manager, THE NATIONAL SUPPLY CO., LTD., Oil Field Div., Calgary, Alberta.

H. H. Zollar, made general manager, Centrifugal Castings Div., Dover, Ohio, SHENANGO-PENN MOLD CO.

John Dunn, appointed general sales manager, PEABODY ENGINEERING CORP., New York.

Fred A. Milnes, will head the enlarged division of Presses and kindred machinery, MOREY MACHINERY CO., INC., New York.

John P. Moorhead, made assistant sales manager, Tent Shelter Div., EVANS PRODUCTS CO., Plymouth, Mich.

William T. Browne, appointed Ohio representative, COMMERCIAL CONTRACTING CORP., Detroit.

OBITUARIES

George A. Spoon, 58, vice-president, Sales & Engineering, Muskegon Motor Specialties Co., Muskegon, Mich., suddenly while on a business trip.

Reed G. Laird, 45, assistant chief metallurgist, The Ohio Seamless Tube Co., Shelby, Ohio, unexpectedly at his home.

Francis L. Stephenson, 62, manager, Structural Steel Sales Dept., Bethlehem Steel Co.

James M. O'Neill, 60, manager of structural sales, Norris, Wheeler & Co., Philadelphia.

Fred G. Teufel, widely known in the storage battery field, and regional sales manager, Gould-National Batteries, Inc., Cleveland, at his home in Cleveland recently.

H. M. Stoneham, plant superintendent, Kay-Brunner Steel Products, Inc., Alhambra, Calif., at the Parkview Hospital, Los Angeles.

No Quartz crystals—

The Iron Age
FOUNDED 1855
Technical Articles

FIG. 1—Special coupling devices for use in ultrasonic testing are made of a liquid column supported in a plastic cylinder with or without metal diaphragms.

Ultrasonic Testing Improved With Use of LIQUID COUPLING

- Liquid searching unit replacing other piezoelectric materials combines the advantages of contact and immersion test methods . . . Crystal wear is practically eliminated . . . Rough surfaces can now be uniformly inspected.

- Results are comparable to immersion method without immersing the work . . . Defects but ⅛ in. below the surface of aluminum are satisfactorily detected . . . The device consists of a water column in plastic tube with or without metal diaphragms.

By J. B. Morgan
Physical Metallurgy Div.
Research Laboratories
Aluminum Co. of America
New Kensington, Pa.

• QUARTZ CRYSTALS or other piezoelectric materials are generally used as transducers in ultrasonic testing. Two methods are in use for introducing the ultrasonic energy into the work. One is the contact method where the transducer is placed in contact with the piece to be inspected. A thin film of a suitable couplant, usually oil, separates the transducer from the piece. In the second or immersion method, the transducer does not contact the piece but is coupled to it through a liquid medium, which generally consists of 1 in. or more of water. Both the transducer and the piece to be inspected are totally immersed.

The contact method, which is widely used, is not well adapted to the inspection of material where the surface is rough, as for example, a sawed surface. In addition, testing at frequencies above 5 mc is greatly handicapped because of the thinness and consequent fragility of the quartz crystals. The testing of material at these higher frequencies is often desirable, however, in detecting discontinuities that lie close to the surface in the inspection of thin material.

The immersion method, since it does not require contact of the quartz crystal with the piece being inspected, permits the inspection of

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The "liquid schnozzle" combines most advantages of the contact and immersion methods . . .

material having rough surfaces as well as the use of high test frequencies. In addition, it readily permits variation of the angle at which ultrasonic energy is sent into the piece being inspected. However, it does require immersion of the piece in a liquid. This is not always desirable or possible, particularly where the piece is large or part of a complete assembly.

A special coupling device or "liquid schnozzle" has been developed that provides a compromise between the contact and immersion methods since it combines most of the advantages of the two methods. It permits the inspection of material having relatively rough surfaces and the use of higher test frequencies. It does not require immersion of the piece being inspected. Although the coupling devices that have been prepared do not include one which permits the variation of angle such as is possible with the immersion method, it appears possible that such a device could be prepared. This could be done by pivoting the crystal and providing a means for holding the crystal at the desired angle.

Since the crystal does not come in direct contact with the piece being inspected when the "liquid schnozzle" is employed, crystal wear is practically eliminated, resulting in a saving, cost-wise. Other merits of the new system are summarized in the table.

The special coupling device is of simple construction and consists of a hollow cylinder filled with water or some other suitable liquid. One

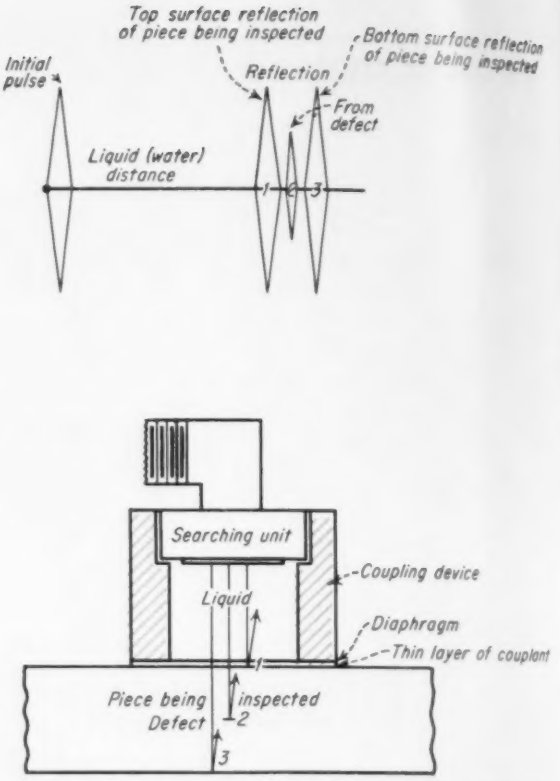

FIG. 2—Coupling device in position for testing and a typical screen pattern obtained using this special device.

end of the cylinder is contacted to the surface of the material to be inspected. The quartz crystal holder is placed in the opposite end. The liquid contained in the cylinder serves as the coupling medium between the crystal holder and the piece to be inspected. Fig. 1 is a photograph of several coupling devices. The cylinder can be made from one of a number of materials, the choice of material being guided by two factors. First, the material must tend to conform to the surface of the part being inspected. Second, the material should not cause undesired reflection indications to appear in the cathode-ray tube pattern.

In most of the tests conducted, a plastic material such as is used as a stripable protective coating for metal parts has been used to form the cylinder. These materials are used because their properties appeared desirable for this application. Rubber has also been used to a limited extent. If units of this type were to be produced commercially, better materials might be found. Such factors as wear-resistance and uniformity would probably be considered. No extensive tests have been conducted to determine the wearing quality of the plastic material; however, no noticeable wear has been noted so far.

Actually, the preparation of one of these devices is so easy that frequent replacement could readily be made at low cost. These devices can be used with or without a diaphragm. When a

ADVANTAGES OF LIQUID COUPLING

1—Better movement over the testing surface is obtained with a "liquid schnozzle" than with a standard contact searching unit alone.

2—More uniform inspection can be made even where the surface is relatively rough.

3—The use of high frequencies is not limited because of the fragility of the crystal as in the case of standard contact units.

4—Inspection can be made closer to the surface by a "liquid schnozzle" than with a standard contact unit.

5—The ultrasonic beam may be introduced into the piece to be inspected at any desired angle.

6—Results comparable to those obtained by the immersion method are obtained without the necessity of immersing the piece.

7—Loss of energy at interfaces where reflection occurs is less than with the immersion method.

8—Use of the "liquid schnozzle" greatly reduces crystal wear, which results in a monetary saving.

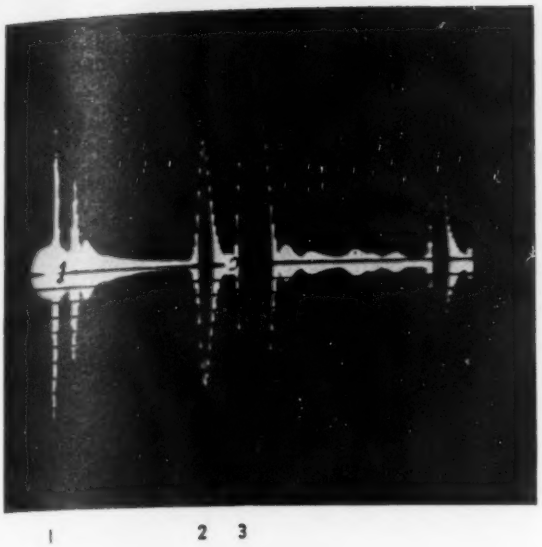

FIG. 3—Reproduction of screen pattern obtained by the contact method at 5mc from Alcoa Ultrasonic Standard Reference Block No. 6 which contained a 6/64-in. diam hole.

Explanation of Indications

1. Initial pulse.
2. Indication of reflection from bottom of hole in reference block.
3. Indication of reflection from bottom surface of reference block.

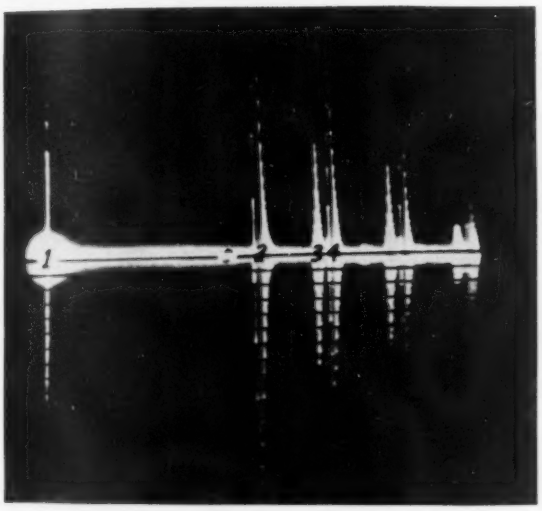

FIG. 4—Reproduction of screen pattern obtained by the use of a special coupling device at 5 mc from Alcoa Ultrasonic Standard Reference Block No. 6 which contained a 6/64-in. diam flat bottom hole.

Explanation of Indications

1. Intial pulse.
2. Indication of reflection from top surface of reference block.
3. Indication of reflection from bottom of hole in reference block.
4. Indication of reflection from bottom surface of reference block.

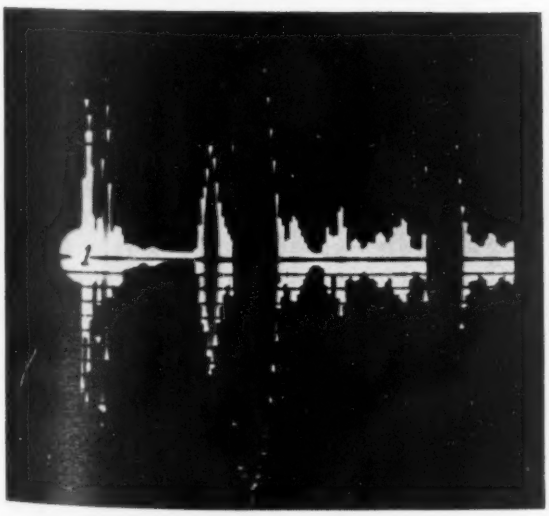

FIG. 5—Reproduction of screen pattern obtained by the contact method at 2¼ mc from Standard Reference Block No. 6 which contained a 6/64-in. diam flat bottom hole.

Explanation of Indications

1. Initial pulse.
2. Indication of reflection from bottom of hole in reference block.
3. Indication of reflection from bottom surface of reference block.

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It was possible to detect a discontinuity located 1/8 in. below the surface of a piece of aluminum . . . Test frequency: 10 mc.

diaphragm is used, it is incorporated as a part of the coupling device in the casting process. Fig. 2 is a sketch showing the manner in which a coupling device is used in the inspection of material and a typical screen pattern that is obtained. In the drawing a coupling device with a diaphragm is shown. However, elimination of the diaphragm does not change the overall screen pattern.

Standard contact searching units have been used with this coupling device. Since the piezoelectric crystal is silver-coated on only one side and the crystal does not come in contact with the metal piece being tested, aluminum foil is placed over the uncoated face of the crystal to complete the circuit. Crystals with both faces silver-coated are more suitable for this application.

Thickness determines column length

Coupling devices of this type have been prepared for use with searching units containing 1/2 in. square, 3/4 in. in diam, 1 in. square and 1 1/8 in. in diam quartz crystals. The wall thickness of the cylinder varied from approximately 3/8 to 5/8 in., depending upon the size of the searching unit employed and the length of the liquid column used between the crystal and the piece being tested. The length of the liquid column to be used is determined by the thickness of the piece to be tested.

In this type of testing as in immersion testing, a reflection of ultrasonic energy occurs at the top surface of the piece being inspected. This reflection appears as an indication following the initial pulse indication on the cathode-ray tube screen. Successive reflections from the surface cause successive indications to appear on the screen. The displacement of the surface reflection indication to the right of the initial pulse indication is determined by the length of the liquid column.

Screen patterns compared

The length of this column is determined by the thickness of the piece to be inspected. For example, if water is used as the coupling liquid, the time required for an ultrasonic wave to travel through 1 in. of water is equivalent to that required to penetrate approximately 4.3 in. of aluminum. In order to prevent disturbing indications caused by reflection from the top surface of the piece being inspected from appearing on the cathode ray tube screen in that portion of the trace corresponding to the thickness of the piece, slightly more than 1 in. of water is required for every 4.3 in. of aluminum.

Comparison of the screen patterns obtained by the contact method and by use of a coupling device can be made from Figs. 3 and 4. Fig. 3 is a reproduction of the screen pattern obtained when a standard 5 mc searching unit was contacted to Alcoa Ultrasonic Standard Reference Block No. 6. The first indication following the initial pulse, which is to the extreme left, originates from the flat bottom of the hole in the Reference Block. The second indication represents the bottom of the block. Using the same searching unit, but this time in conjunction with a "liquid schnozzle," the pattern shown in Fig. 4 was obtained from the same reference block.

Can vary pulse to pulse distance

This pattern is identical to that obtained with the immersion method. The first indication following the initial pulse, which is to the extreme left, represents the top surface of the reference block. This is the surface to which the crystal is contacted in the contact method. The second indication to the right of the initial pulse, originates from the flat bottom of the drilled hole in the block. The third indication represents the bottom of the block. The two following indications represent higher order reflections from the bottom of the hole and the bottom of the block, respectively. The space between the initial pulse and the first indication represents the liquid or water distance between the crystal and the block. This can be shortened or lengthened by varying the height of the liquid column. Figs. 5 and 6 are similar reproductions of screen patterns obtained using a test frequency of 2 1/4 mc.

Results have been good

In the construction of one of these devices for use where the ultrasonic beam strikes the test piece surface normally, it is important that the face of the crystal be kept parallel to the test surface. If this parallelism is not maintained, the refraction of the ultrasonic waves in the metal occurs. In a water-aluminum system where the velocity difference is large, a small angle of incidence results in a large angle of refraction.

Where it is desirable to send the ultrasonic beam through material at some angle other than the normal, the coupling device is cast so that the piezoelectric crystal will be held at the proper angle. The angle of incidence required to obtain the desired angle of refraction can be determined by the use of Snell's Law.

The results obtained using these coupling devices have been good. Except when a diaphragm is used, there are no additional interfaces introduced by the use of this device, and results equal to those obtained by the contact method have been obtained using water as a couplant, that is, indications of equal amplitude have

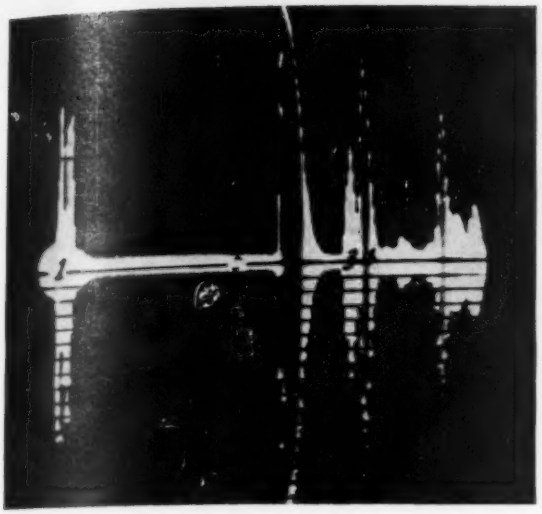

FIG. 6—Reproduction of screen pattern obtained by the use of a special coupling device at 2¼ mc from Alcoa Ultrasonic Standard Reference Block No. 6 which contained a 6/64-in. diam flat bottom hole.

Explanation of Indications

1. Initial pulse.
2. Indication of reflection from top surface of reference block.
3. Indication of reflection from bottom of hole in reference block.
4. Indication of reflection from bottom surface of reference block.

been received by both methods. Energy is absorbed during the passage of the ultrasonic beam through the liquid couplant and this factor becomes appreciable in the case of oil, increasing as the viscosity of the oil increases. Also, it is evident that the energy loss increases as the length of the liquid column increases. With the immersion method, where the piece being inspected is completely surrounded by the coupling liquid, an energy loss occurs at each liquid-metal interface where reflection occurs. This becomes quite noticeable when an ultrasonic beam is sent through thin material at an angle. In this case, a large number of liquid-metal interface reflections occur.

Used on saw-cut surfaces

It was possible to detect a discontinuity located ⅛ in. below the surface by normal testing of a piece of aluminum using one of these devices at a test frequency of 10 mc. This is an improvement over the contact method where it is generally assumed that discontinuities ½ in. or closer to the surface are not detectable because of the effect of the initial pulse. This distance from the surface at which discontinuities can be detected varies with frequency, the distance becoming greater as the frequency is decreased. Pieces with sawed surfaces, which would have given poor results by the contact method, have been inspected successfully.

For general use, a coupling device with a diaphragm is preferred. This retains the liquid in the cylinder, thus permitting the device to be transferred from one part to another without loss of couplant.

The diaphragm should be as thin as is practical in order that optimum transmission of the ultrasonic energy into the piece being inspected is obtained. Use of a diaphragm made of the same plastic material as that of the cylinder results in an energy loss. However, this loss can be compensated for by an increase in the control settings of the ultrasonic generator. When aluminum is used as a diaphragm, the energy loss is negligible provided good contact to the piece being inspected is made; however, it appears more difficult to maintain this contact than with plastic materials. Difficulty in obtaining a good seal between the aluminum diaphragm and the plastic cylinder was also encountered.

How to maintain liquid level

When a diaphragm was not used, seepage of couplant from the coupling device was generally very small, except, of course, when transferring the device from one piece to another, in which case the liquid had to be replaced. Appreciable seepage did occur when examining some curved parts; presumably because of a change in curvature. Several units have been prepared which include a means for maintaining the proper level of liquid. This is done by casting a tube in the coupling device which in turn is connected to a source of the liquid.

With a diaphragm you can transfer the tester from part to part without losing the liquid couplant . . . It's preferred for general use.

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Accurate fixtures without machining—

Glass Laminated Plastics *SPEED UP Tooling Programs*

By W. G. Patton
Asst. Technical Editor

◆ Glass cloth-and-resin laminate-coated cast iron welding and assembly fixtures will be used by a major automobile producer for its 1954 models . . . The new plastic-clad fixtures are cast undersize and built up with non-shrink laminate to required contour . . . No machining is required.

◆ Fixtures are light in weight and high in strength and can be built in much less time than conventional tooling . . . Thermal-setting resin used is dimensionally and chemically stable . . . No storage refrigeration is needed . . . The material cures at room temperature, is easy to patch and bonds readily to metal or glass.

◆ ASSEMBLY FIXTURES for several of the 1954 lines of passenger cars are being built and duplicated in record time to meet the requirements of stepped-up passenger car tooling programs. The same foundry patterns are employed as for machined castings except that the patterns have to be modified to produce an **undersize** casting. No stock is left on the casting for machining.

Foundry analysis, pouring and shakeout procedure is unchanged from the previous casting method. A dimensionally-stable glass laminate plastic coating approximately ¼ to ½ in. thick is tightly bonded to the surface of the gray iron casting. This plastic coating provides a wear-resistant, accurate surface that can be drilled and tapped and is not subject to deterioration by acids, greases or organic solvents.

The plastic is self-curing and does not require heat treatment.

In addition to automotive applications, laminated plastics may be used to advantage by the aircraft, appliance, metal furniture and tractor industries either as checking fixtures or for assembly or welding or forming dies.

The complete elimination of machining plus the fast tooling programs make this new technique attractive for short run applications. If desired, hand-built service parts made of plastic laminate can be made either for experimental purposes or for very short run service parts.

Another interesting application made possible by the excellent adhesive characteristics of Ren-ite is its use as a bonded plastic layer, for example, on a metal pulley. While the success of such an application will largely depend on the heat generated in service, the noncorrosive, constant friction characteristics of the material have interesting possibilities. As a rule, recommended top service temperature for Ren-it is 180°F.

Prototype parts can be produced to check conveyor clearance, stacking in box cars and for other purposes. The use of plastic-coated

checking fixtures is expected not only to reduce tooling time for stamped metal parts; it should also cut tooling costs.

The gray iron castings for the new assembly fixtures for auto hood were built by Lansing Foundry Div. of Detroit Gray Iron Foundry Co. The plastic laminate bonded to the surface of the gray iron casting is Ren-ite, a thermosetting resin especially formulated for tooling purposes by Renaud Plastics, Inc., Lansing. The new plastic has been under development for 3 years.

Only minor changes in the previous wood foundry patterns are necessary. The most important change is lightening the sections. This design change eliminated about 15 pct of the material previously required. No Kellering, barbering and spotting operations are necessary.

Start with wood die model

Core boxes were, of course, enlarged to compensate for the change in section. The gray unalloyed iron is the same composition used by Lansing Foundry for dies and fixtures.

Following shakeout, gates and risers are removed from the casting. The casting is then placed on a car and wheeled into a shot-blast cabinet for preliminary cleaning. Following chipping, the casting is shot-blasted again to improve the surface and insure a good bond with the plastic laminate.

Shot blasting removes surface carbon and also shows up any surface imperfections that might interfere with the bond between the casting and the plastic laminate. Fig. 1 shows the 2000-lb casting after chipping and shot blasting. The casting is now ready to receive the plastic laminate coating shown applied in Fig. 2.

Specific steps taken to prepare the fixture are as follows: Work starts with the wood die model. Usually this model is inside of metal. Wax sheets corresponding to the thickness of the steel are placed over the model which is previously waxed and rubbed down. A master plastic mold is then made; this model can be used to make duplicates without any overlay

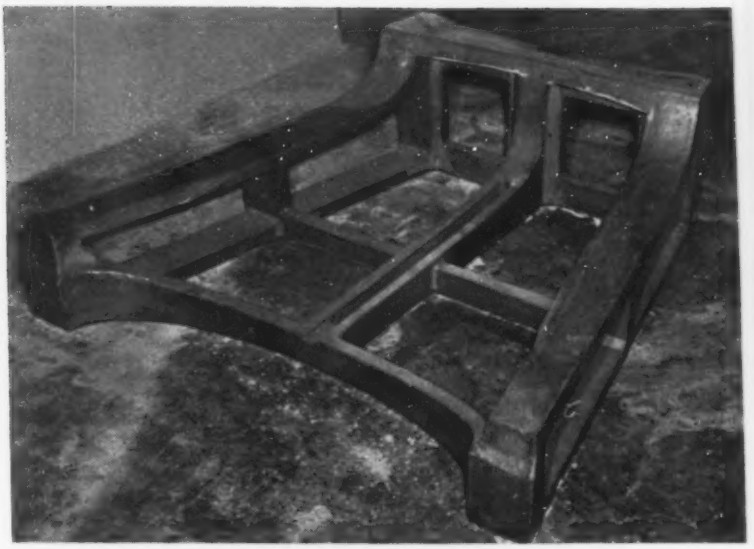

FIG. 1—After chipping to remove surface defects and shot blasting to remove loose surface material, a casting is ready to receive a glass-laminate plastic coating.

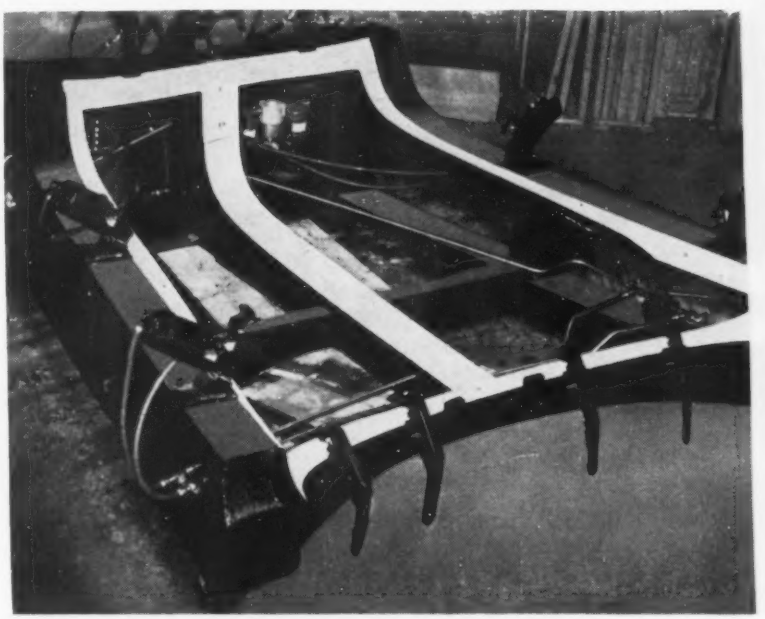

FIG. 2—A dimensionally-stable glass laminate plastic coating ¼ to ½ in. thick is bonded to a gray iron casting.

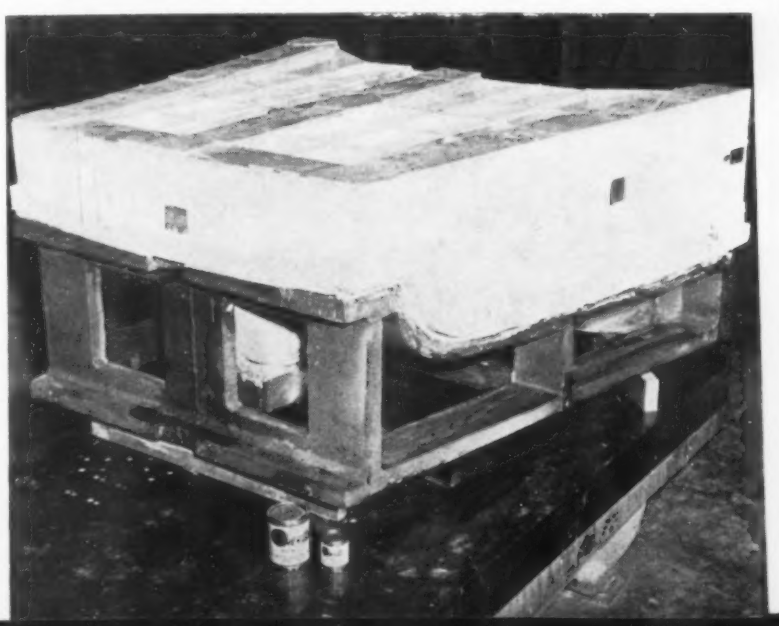

FIG. 3—The laminate is applied directly to the surface of the model after a parting solution is also applied. The laminate is then built up and adhesive bonds the laminate to the casting.

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Layers of glass cloth required will vary with the shape of the part and the application . . . Material is self-bonding . . .

of sheet wax. The customer's die model can now be released.

Suitable plywood backup and support is given the mold, Fig. 3. At the same time, the sides and ends are extended to provide mounting space for the clamps that will later be used on the fixture. It is now possible to make as many duplicates of the checking or assembly fixture as may be desired.

The next step is to produce a reverse model of the master. This is identical with the original working model except that it is outside of metal and the sides and ends have been extended. It is, also necessary to apply a filled-in plywood backup to support this model.

Waxed and polished coating applied

Buildup of the laminate starts with the application of a coating of parting solution over the working surface of the model. After the parting solution is dry, a waxed and polished layer about 1/32 in. thick of Ren-ite surface coat mix is applied. The basic material and a hardener are furnished in pint and quart size cans. It is only necessary to mix the contents of the two cans thoroughly. There is no waiting. The cans may be stored at room temperature.

After the initial layer of surface coat resin RP 1120 has set—this occurs in about 40 min.—the first layer of glass cloth is applied. This is followed by an application of Ren-ite RP 1130, the Laminating Resin. Then another layer of glass cloth is applied. The process is repeated until about 6 layers of cloth are applied.

The number of layers of glass cloth will vary with the shape of the part and the application. Prototype models, for example, may require only three layers of cloth while some dies or fixtures may use up to a dozen layers of glass cloth to build up a suitable laminate.

After cleaning the working surface of the iron casting to be sure it is free from grease or dirt, the casting is placed on top of the built-up laminate. The material is self-bonding. The casting remains in this position for several hours.

Laminate separates easily

Fig. 3 shows a casting ready for removal. Previous use of the parting solution makes it easy to separate the casting and its bonded laminate from the model. The layers of laminate are now firmly joined to the gray iron casting.

Location of the clamps is taken from the engineering drawings. After locating the clamp positions, holes can be bored and tapped, Fig. 4, through the plastic coating and into the iron. There is no chemical attack on tools by the resin used in the laminate.

Fig. 4 shows an assembly fixture with a steel stamping in place. The steel stamping is held securely in position by means of clamps. The fixture may be used for checking the stamping as well as for assembly. In this particular application, the stamping is first located at its curved end. Air clamps used to draw the stamping securely into position are shown in Fig. 4 and 5.

Has many other uses

Table I summarizes the properties of Ren-ite-bonded materials as a tooling plastic. In addition to checking and welding fixtures, Ren-ite can be used to make models, prototypes, spotting racks, panels and forming dies.

Specific physical characteristics of Ren-ite are shown in Table II. The specific gravity of the bonding resin is 1.129 compared with 7.87 for iron and 2.699 for Al. Linear co-efficient of

FIG. 4—Steel stamping clamped in place on a checking and assembly fixture. Stampings must be accurately located.

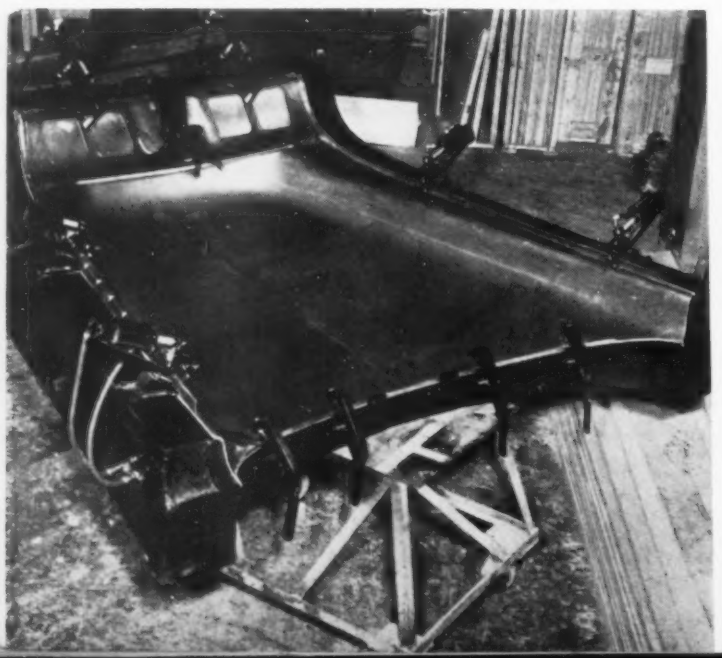

TABLE I

PROPERTIES OF REN-ITE

Non-corrosive to tools and fasteners.
Sets up at room temperature.
Saves up to 4/5 of the weight of wood models.
Layers can be built up to any desired thickness.
Material is not brittle; no brass edges are necessary.
Material has dimensional stability; no after-shrinkage occurs.
No heat or bag mold is required.
Packaged material requires no refrigeration or mixing equipment.
Excellent physical properties.

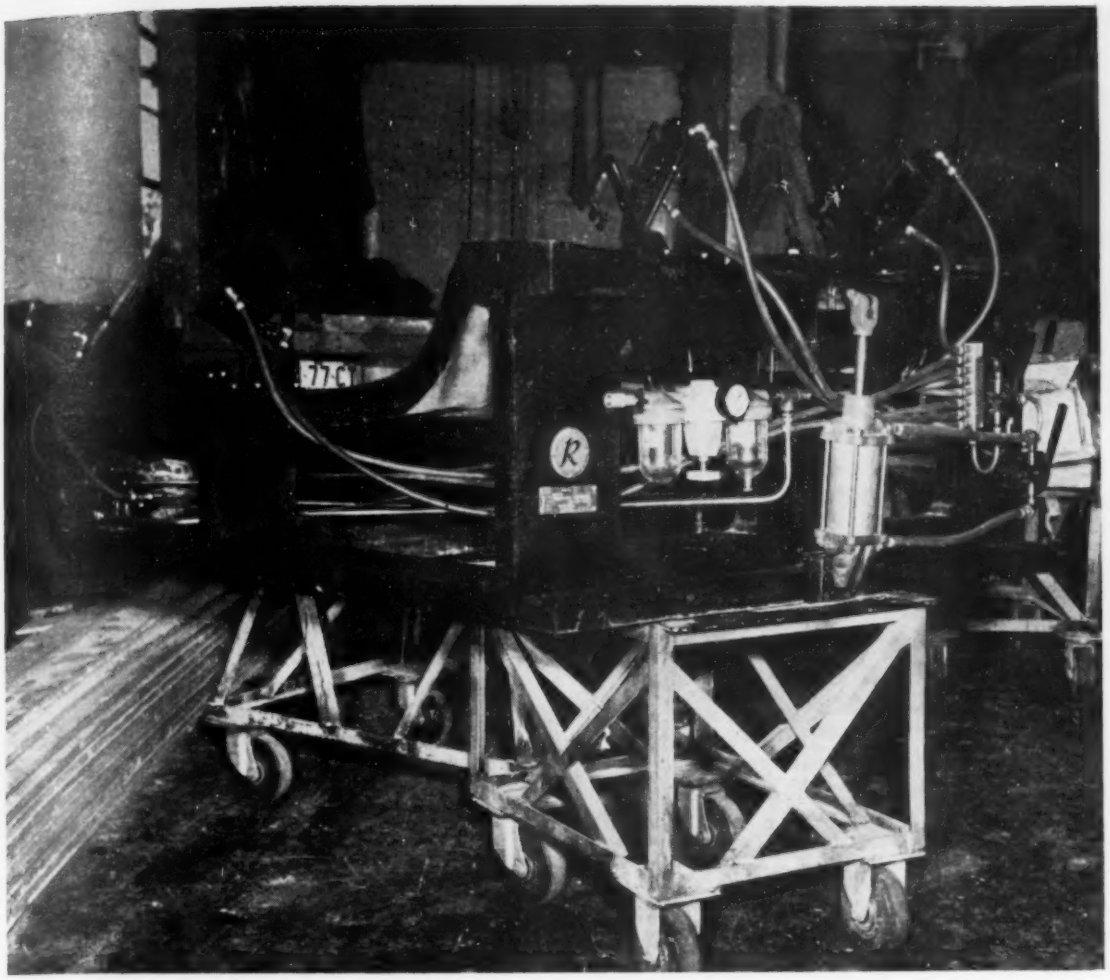

FIG. 5—Considerable power must be applied to clamp a part accurately in position. Air clamps are generally used.

TABLE II

METALS V. GLASS-LAMINATES

A Comparison of Properties

	Sp. Gravity	Linear Coefficient of Expansion Micro In/In./°F
Ren-ite	1.129	47.4
Aluminum	2.699	13.3
Iron	7.87	6.5
Titanium	4.54	13
Nickel	8.90	...
Molybdenum	10.2	2.7
Copper	8.96	9.2
Ren-ite Laminate	....	8.7

expansion Micro In/In °F for Ren-ite glass cloth laminate is 8.7 as compared with 6.5 for iron and 13.3 for Al.

Two Ren-ite resins are used. The surface coat material is available in two "package" sizes, totaling 17 lb, 10 oz and 8 lb, 13 oz. The Ren-ite laminating mix is available in approximately the same size package. After mixing the base material and the hardener, the material is applied with a paint brush. The material should be used within 30 min.

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A good turn—

Better Setups, Spray Lubrication Increase Parts Output

By E. C. Beaudet
Machinery Editor

◆ Greater production and lower tool costs are being achieved at Studebaker Corp. on new setups for turning steering knuckles . . . Automatic lathes with multiple tooling have been replaced by copying lathes . . . Cutting tools are solid triangular carbide.

◆ New setups have eliminated turning and grinding operations and given greater machine flexibility . . . Spray mist lubrication is employed . . . The oil is smokeless and odorless . . Tool life has been increased about 30 pct.

◆ MARKED SAVINGS in the production of steering knuckles and steering knuckle pins for use in Studebaker Champion and Commander models have been made possible at the company's South Bend, Ind. plant through a combination of single-point, profile turning and oil mist lubrication. Use of a copying lathe to manufacture these parts rather than multiple-tooled equipment eliminates several operations, lowers tool costs and saves manhours and machine time. Tool life is materially increased when a lubricant is sprayed on the cutting tool.

The steering knuckle shown in Fig. 1 is made from an 8640 alloy steel forging heat treated to 248 to 286 Bhn. In machining the steering knuckle forging a Monarch Mona-Matic lathe equipped with an air gage tracer is used. All spindle diameters are turned, the backing plate flange is finished faced, and the thread end and shoulder adjacent to the large bearing diameter are chamfered in one pass and using only one tool.

A variable-drive spindle motor changes speeds from 800 rpm on the radius to 400 rpm when the tool reaches the flange. Surface speed during machining ranges from 147 to 494 sfpm. Tolerance held on the piece is ± 0.0015 in. Metal removal is heavy with the depth of cut ranging from 3/32 to 5/32 in. depending on the stock, see Fig. 2. After the one turning operation only a finish grinding operation is required to finish the piece. Production of these parts averages 65 per hr with one operator running two machines. Both right and left hand steering knuckles are turned in the same fixture making the operation flexible. This is made possible by controlling the depth of the work center to ± 0.001 in relation to the center line of the king-pin hole.

On the previous setup, multiple-tooled, automatic lathes machined the piece in two operations on two machines. In the first operation, A in Fig. 3, the seal diameter, large and small wheel bearing and thread end were turned, the backing plate flange was faced and the radius turned. The second operation, B in Fig. 3, consisted of turning the taper, chamfering the thread end, forming the radius and facing the shoulder adjacent to the large bearing. Surface speed ranged from 65 to 70 sfpm. One operator ran both machines. With this setup difficulty was encountered in holding a tolerance of ± 0.005 in. This made it necessary to rough as well as finish grind the piece after turning.

In comparing the two methods of machining the steering knuckle, several advantages of the present one can be seen. Ability to maintain closer tolerances eliminated the need for rough grinding before finish grinding. Savings in the cost of perishable tools are substantial. Seven perishable tools were used on the two machines previously while on one is required in single point turning.

Added to the tool cost saving is the saving in setup time. On the tracer controlled lathe setup time is practically eliminated except for changing the template. Styluses used are chrome plated to retain accuracy over a longer period without wearing, see Fig. 4. Accurate tool setting is much less difficult to maintain that it is on a multiple-tooled setup.

Use of spray lubrication has greatly increased the life of the carbide cutting tools. The oil is smokeless and odorless. In turning the steering knuckle a K4H or WH grade solid triangular carbide insert is used in a Kennamatic tool holder. The tool holder is offset 3 degrees to obtain clearance for cutting the flange. With

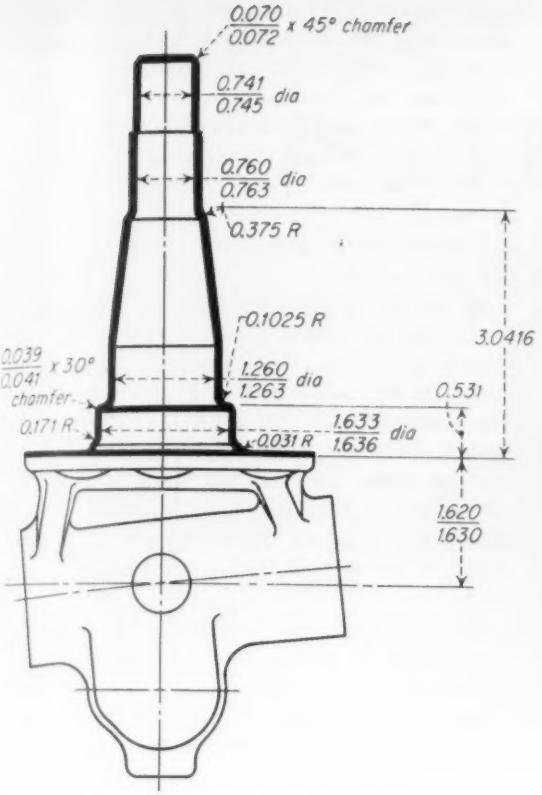


FIG. 1—Production of this 8640 alloy steel steering knuckle was increased through use of tracer lathe and spray lubricant.

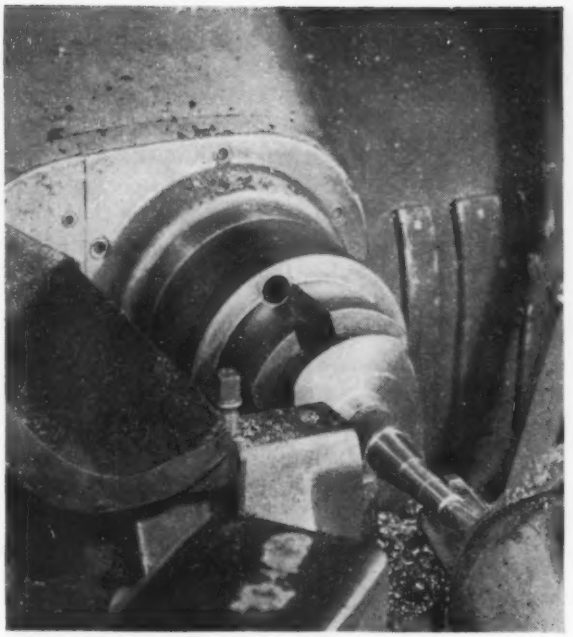
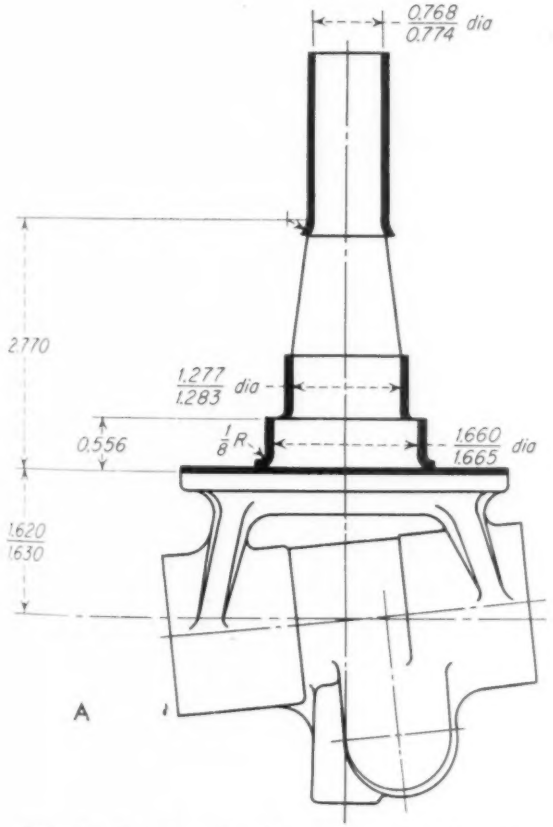


FIG. 2—Front wheel spindle in Monarch lathe showing depth of cut. Work has been finished up to large end of taper.



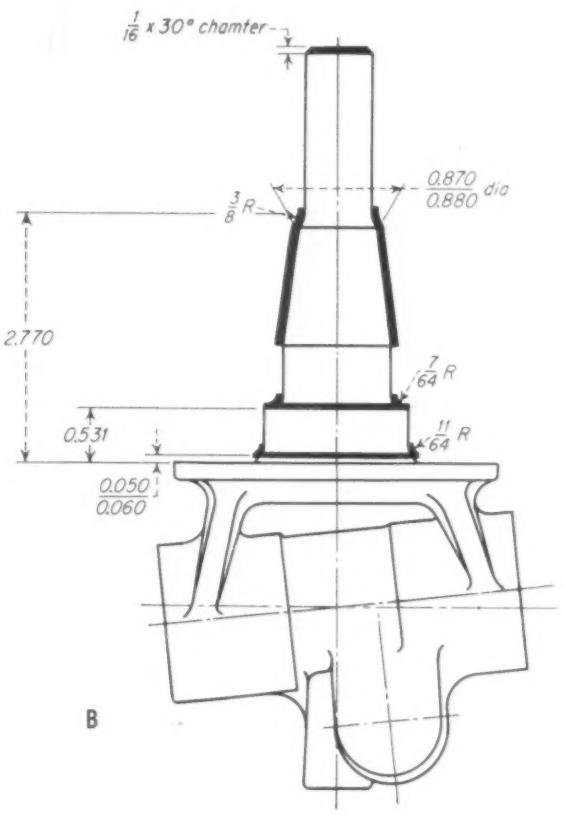


FIG. 3—Steering knuckle was previously machined in two setups on two automatic lathes. Drawing A, left, shows outline of first operation, drawing B, the second.

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oil mist lubrication, increases in tool life averaging 33 1/3 pct have been achieved.

A 38 lb. low pressure air system directs the spray along the side of the tool under the chip at the point of the tool, see Fig. 5. Chips curl away from the spray and the tool point remains cool. Positioning the spray directly beneath the tool would be even more effective but the position of the flange during later cutting stages would create interference.

A main advantage lies in the fact that the lubricating spray is consistently applied to the tool and no quenching action takes place. The heat never travels past the tool point. These pieces had to be turned dry previously because flooding the carbide tools on the former setup would cause cracks at the tool tip due to quenching. It was also difficult to control excessive splashing of the coolant at high spindle speeds. Cost savings on steering knuckle production under this new setup are about 12¢ per piece or 25¢ per car.

Use of a tracer lathe and spray mist lubrication also permitted excellent savings and increased output in the production of the steering knuckle pin shown in Fig. 6. They made possible the elimination of two rough grinding operations and one rough turning operation. Tool costs again were cut, setup time greatly reduced and tool life substantially increased.

In this operation all diameters, adjacent shoulders and radii are turned; and the thrust collar, lower end of three bearings and thread ends are chamfered on a Monarch tracer lathe. Average surface speed is 300 sfpm. Previous setups called for rough turning the part on one automatic lathe and finish turning it on another.

On the multiple-tooled setup one operator running two machines could turn out 81 rough-turned pieces per hr. Another operator could turn out 87 finish-turned pieces per hr using two automatic lathes. With the new setup one operator turns out 72 finished pieces per hr on two machines. Thus almost the same amount of production can be turned out with half the manpower and half as many machines. Increased tool life using spray mist lubrication is about 25 pct.

Flexibility is another advantage cited by Studebaker in these new production setups. If a part change occurs no expensive and time consuming retooling is necessary. All that is necessary to effect a part change is to change the template.

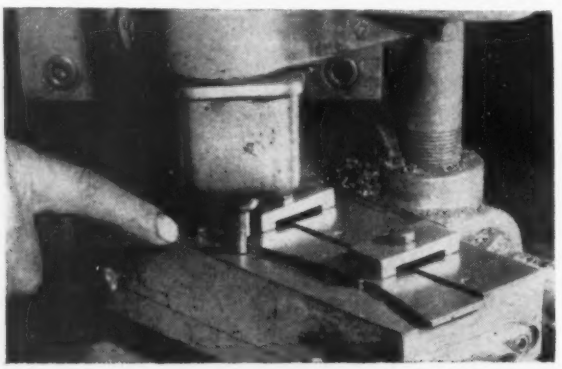

FIG. 4—Monotrace template and stylus. The stylus is in the same relative position as the cutting tool shown in Fig. 2.

FIG. 5—Oil spray directed at tip of cutting tool. In operation, the oil strikes just under the cutting edge of the tool.

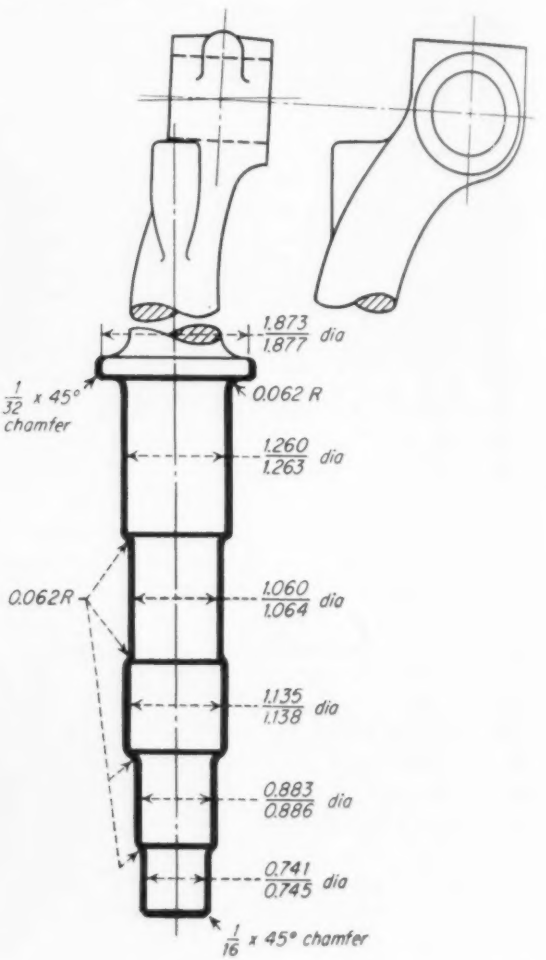

FIG. 6—Machining this steering knuckle pin in new setup eliminated one rough turning and two rough grinding operations.

Better finish too—

MILL SPEEDS ROLLING of Thin Copper Strip

By Edward C. Allen
Research Metallurgist
Chase Brass & Copper Co., Inc.
Cleveland

◆ **Better dimensional uniformity and improved soundness of rolled stock have resulted from use of a new reversing cold strip mill at the Chase Brass plant, Cleveland.**

◆ **Using a Sendzimir 23-25, Chase gets reductions of 90 to 95 pct in copper strip rolled to 0.0025 in. . . . Improved surface finish with fewer irregularities and a higher luster are possible with the mill . . . Greater strip flatness is obtained through use of a lateral roll adjustment.**

◆ AT A TOP SPEED of 1000 fpm, thin brass and copper strip in widths to 24 in. rolls from a new reversing cold strip mill at the Upson Road plant of Chase Brass & Copper Co., Inc., Cleveland.

Chase, a subsidiary of Kennecott Copper Corp., recently installed a new Sendzimir ZR 23-25 mill to speed production of strip used in making honeycomb and lock-seam tubes for automobile heaters and radiators. The mill handles incoming strip up to about 0.080 in., and, in a series of rolling operations, reduces it to 0.0025 in.

The thin strip rolled on this mill, sold for shim stock, among other uses, has excellent dimensional uniformity, surface finish, soundness and formability.

Because the 24-in. strip is uniformly thick from edge to edge, there is also dimensional uniformity in slit stock. Strips of 1 to 3 in., slit from the 24-in. coil, are identical in thickness. This is a significant advantage when the fabricator's tooling demands maximum strip uniformity.

Reductions range from 90 to 95 pct without intermediate annealing. These drastic reductions provide a severe inspection of strip soundness. Only metal having a high degree of soundness can withstand such reductions without failure. This also is a highly significant advantage when the strip fabricator's tooling is designed to require the utmost in formability of the stock being used.

Finish of the rolled strip is excellent. This is due to several factors. Since the mill is a reversing mill, during rolling the ends of the coils remain wrapped on the two reels and are never rolled. Consequently, "tail-mark" indentations in the work rolls do not occur. This eliminates a cause of imperfections on the strip surface.

Pits in the work rolls, which produce tiny humps on the strip surface, and other defects in the work rolls, which generate their own characteristic imperfections, do not present a problem. Since it takes only about one minute to remove the two work rolls from the mill, and replace them with a freshly ground pair, surface defects are readily avoided and with only insignificant interruptions of production.

The drastic reductions obtained in rolling have a decisive effect on the surface finish of the thin strip. To obtain these reductions between anneals, about a half-dozen passes are required. Each time the strip is reduced in its passage through the mill, the work rolls burnish

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To change strip edge pressure, tapered rolls may be adjusted laterally . . . Roll pressure can be eased independently at each edge.

the strip surface a certain amount. The cumulative effect of burnishing on several passes is the removal of surface irregularities and production of a remarkably high luster on the finished strip.

Heretofore, production of thin copper alloy strip in widths greater than 12 in. has been difficult in conventional mills. Design features incorporated in the Sendzimir mill cope with many variables which have made the production of thin metal wider than about 12 in. extremely difficult on mills of conventional design.

The Sendzimir mill is a cluster mill in a rigid housing. The mill housing is a large steel box with the interior specially shaped to contain the two roll clusters. Each roll cluster consists of four main bearings in saddles held rigidly in the mill housing, three second intermediate rolls, two first intermediate rolls and one work roll. In all, there are 20 rolls, arranged in two roughly triangular clusters, one above and one below the mill pass line.

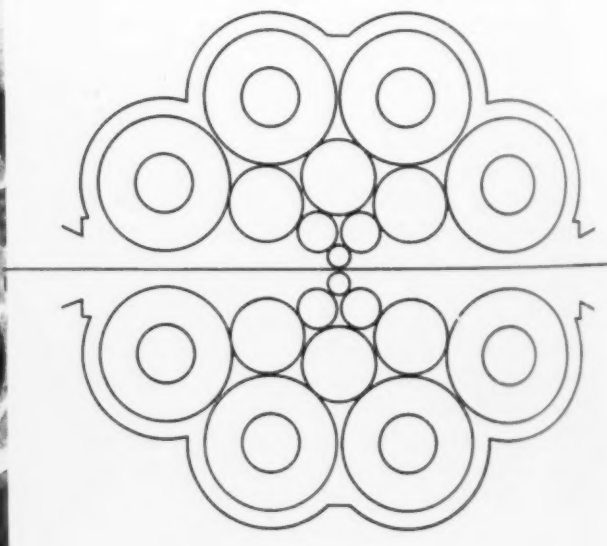
Primary shape control is provided by opening or closing the roll gap slightly at any one or all of five points spaced equally across the roll face. In this way, concave or convex mill shapes, or a slight crown, or hollow, at any one of the five points, may be produced. This crown adjustment feature provides a quick and easy means of compensating for any irregularities in the shape of the incoming strip or in the mill itself.

The other shape control feature consists of two pairs of laterally-movable back-up rolls, with tapered ends, one pair in the top roll cluster and the other pair in the bottom roll cluster. The top pair is tapered on one end, the bottom pair on the other end. The tapered end rolls are the first intermediate back-up rolls, against which the work rolls ride.

Tapered ends on these rolls provide a means of reducing roll pressure on the edges of the strip. This reduction of edge pressure is necessary to produce flat strip, since resistance to deformation is substantially lower at the edges than in the body of the strip. With uniform roll pressure from one edge of a strip to the other, metal given anything more than a slight reduction will have wavy, or rippled, edges, which get worse and worse rapidly if increased reduction is attempted.

Perfectly flat strip is obtained, even with reduction of 30 to 40 pct per pass, by moving the tapered-end first intermediate rolls laterally to provide the amount of strip edge pressure relief required for the particular alloy, hardness, gage, and reduction being made. Lateral adjustment of these rolls is made easily and quickly. Since the two pairs of rolls are tapered

CLOSEUP OF ROLL CLUSTERS with work rolls in place. Note rack mechanism, top and bottom, for changing position of rolls.



TOP AND BOTTOM roll clusters of the ZR 23-25 Sendzimir mill are shown in this schematic drawing of rolls and strip. First intermediate rolls are 2 13/14 in. in diam; second intermediate rolls, 5 11/32 in. in diam; bearing, 8 55/64 in. in diam.

on opposite ends, the roll pressure at each edge of the strip can be relieved independently of the other edge.

These features have resulted in a highly flexible mill for rolling thin strip. All finish thicknesses within the mill's capacity can be produced in one day, or in one shift, with only minor adjustments when changing from one finish thickness to another. Consequently, production delays for roll changes are insignificant.

The unique metal shape controls, plus the small work rolls and the use of front and back tension in rolling, permit reductions as high as 90 to 95 pct without intermediate annealing. Reductions per pass, in the earlier stages of rolling, are about the same as made on conventional 4-high mills. On the latter passes, however, even though the metal is getting harder and harder, substantial reductions can still be made because of the small work rolls and the use of back tension on the strip. A good metal shape is obtained primarily by reason of the mill's shape controls and, secondarily, by the use of front tension on the strip.

Operation of the mill is simple. Rolling is done by passing the strip back and forth through the mill as many times as required to obtain the desired total reduction. The strip is coiled up on one winding reel and uncoiled from the other, for each pass except the first. On this pass, the coil feeds off an independent pay-off reel and passes through a back tension and flattening stand before entering the mill.

Two Pratt & Whitney contact gages measure thickness of the strip entering and leaving the mill. Strip thickness at each of these points is registered on indicating meters on the operator's control panel.

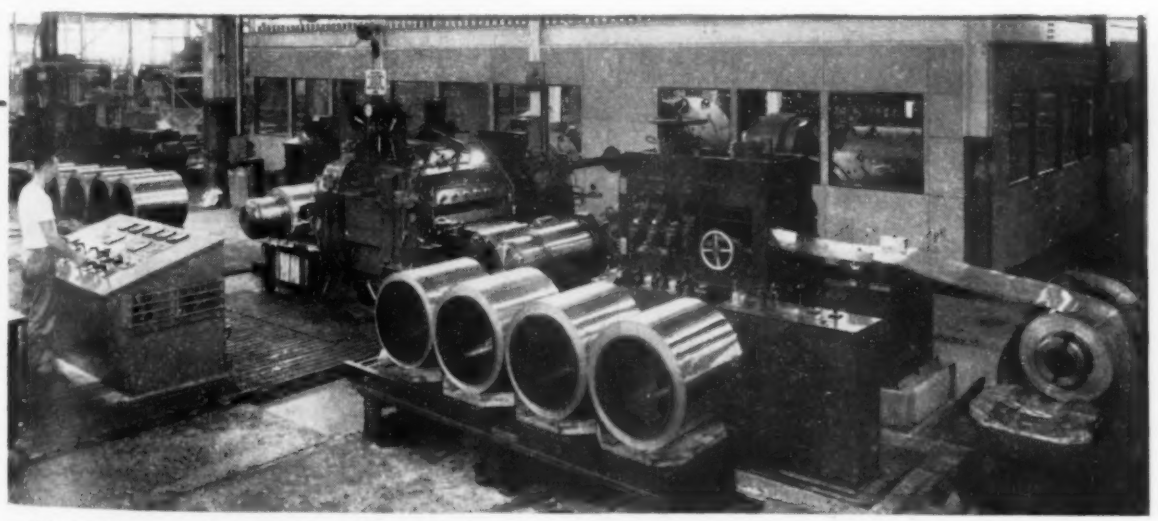
The mill is powered by a 500 hp variable speed direct current motor.

The two reels are powered by 150 hp variable speed direct current motors. A Rotorol motor generator set controls these motors automatically. This gives synchronized mill and reel speeds or diameter of the coil on each of the two winding reels. Front and back tensions on the strip are controlled automatically also, at the set value selected, regardless of changing diameter of coil on the winding reels.

WORK ROLLS, 1 9/16 in. in diam, can be removed in about 1 min by mill operator.

Work rolls are 1 9/16 in. in diam. The four first intermediate back-up rolls are 2 13/16 in. in diam. The six second intermediate back-up rolls are 5 1/32 in. in diam. The eight main bearings are 8 55/64 in. in diam. Four of the six second intermediate back-up rolls are driven. These are the only driven rolls in the mill.

The 20-in. diam winding reels are four-segment, double-pyramid, hydraulic expanding and contracting reels.



ON FIRST PASS thin copper and brass strip from straightener, right, runs directly to Sendzimir mill. Straightener was built by Waterbury Farrel Foundry & Machine Co.

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DOUBLE MELTING Produces Homogeneous Titanium Alloys

By R. J. Van Thyne, Associate Metallurgist
D. H. Turner, Assistant
H. D. Kessler, Supervisor
Nonferrous Metals Research
Armour Research Foundation
Chicago

◆ Pressed and sintered sponge electrodes have been discarded . . . Initial ingot is now forged into rod which serves as the electrode in second melting operation.

◆ Hardness pickup of 10 to 30 Bhn experienced in double melting practice but homogeneity greatly improved . . . Ingots weighing up to 200 lb may soon be produced in this pilot plant furnace at Armour Research Foundation.

◆ HOMOGENEITY in commercial titanium-base alloy ingots has presented a serious problem. Arc melting under an inert atmosphere in water-cooled copper crucibles is generally used, as this melting technique is the only commercial method that results in uncontaminated alloys. However, ingots produced in a furnace of this type using a water-cooled tungsten-tipped electrode are often severely segregated.

Two modes of segregation are encountered due to (1) the relatively small amount of metal that is molten at a given time; the alloy additions do not have an opportunity to thoroughly distribute themselves throughout the metal mass, and (2) high density additions sink to the bottom of the molten bath before melting can be accomplished and remain as metallic inclusions. For most applications these types of segregation cannot be tolerated as it results in variations in mechanical properties which cause later fabrication problems.

A double arc-melting method was designed to produce homogeneous ingots for experimental purposes. A variation of this method could be applied commercially where other methods fail to give uniform alloys.

In very small ingots, up to 250 g, homogeneity can be achieved by melting and remelting on both sides of the "pancake"[1] in a furnace of a particular type.[2] This is impractical in large ingots however, because of the very limited depth of melting which can be achieved.

Consumable electrode arc melting of titanium was begun at the Armour Research Foundation in 1948[3] At that time electrodes were formed by pressing and sintering sponge and the alloy additions into rod. Ingots produced in this single melting operation were fairly uniform but did not attain the desired degree of alloy homogeneity for phase diagram determinations due to the difficulty in getting the additions equally distributed throughout the electrode.

A later innovation was a double melting process utilizing the nonconsumable electrode furnace for the initial melting, forging the resulting ingot to rod, then remelting this rod as an electrode in a consumable electrode furnace. This seemed the best approach to improved alloy homogeneity for the following reasons:

1. All of the metal, including high melting point additions, which may not have been completely dissolved during the first melting operation, must pass through the arc on remelting.
2. A larger and hotter molten pool is maintained in the consumable electrode furnace than in the nonconsumable electrode type because higher currents are applied.

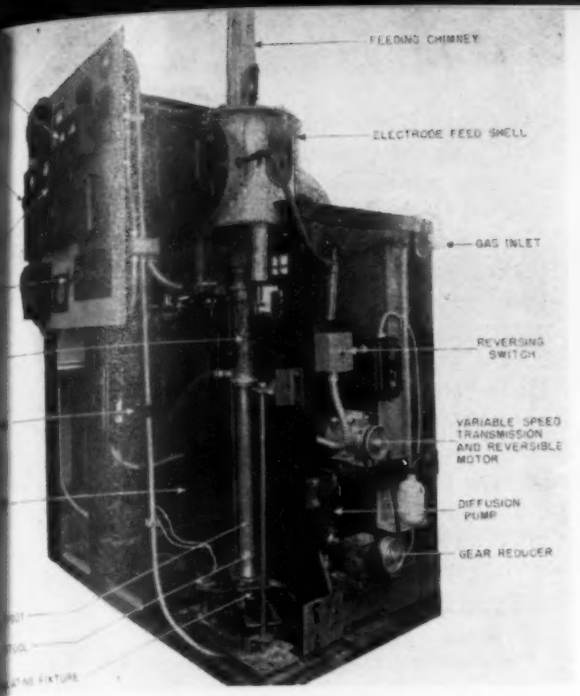

FIG. 1—The continuous casting arc-melting furnace employed consumable electrodes.

When the need for large titanium-base alloy ingots for research purposes presented itself, the consumable electrode arc furnace used[4] for melting molybdenum-base alloys was adopted for continuous casting. A photograph of the apparatus is shown in Fig. 1. A schematic diagram of the furnace is presented in Fig. 2.

Electrodes are prepared by first nonconsumable electrode arc melting the sponge and additions using a belt type charging hopper to build up a 4-lb ingot. This furnace and its products are shown in Fig. 3. The ingots are forged to ½-in. diam rods in 5 to 6 lengths. The forged rods have been surface cleaned by sand blasting followed by acid dipping and more recently by centerless grinding. When the double melting operation was carried out using the sand blasted and etched electrodes, a hardness increase of approximately 10 to 30 points Bhn (corresponding to a pickup of 0.02 to 0.08 pct O_2 and/or N_2) was obtained. As more surface metal is removed by centerless grinding, less contamination should result; however, the scrap loss is higher.

Automatic arcwelding controls are used to adjust the arc voltage and electrode feed rate. Two 500-amp AC arcwelding transformers connected in parallel supply the power. Two additional transformers will be added in the near future to increase the current capacity so that electrodes larger than ½ in. in diam can be used. The electrode feed mechanism consists of spring loaded rollers driven by a variable speed motor. Power is transmitted to the electrode through two spring-loaded molybdenum contacts.

The ingot-retracting mechanism includes a reversible motor, a variable speed transmission, a gear reducer, and a long screw which is attached to an insulated fixture secured to the crucible bottom. The retracting speed can thus be adjusted to the ingot build-up rate. The melting rate at the present power level is on the order of 1 lb per minute. It appears to vary somewhat with the alloy composition.

The crucible consists of a ¼-in. wall copper tube that is enclosed in a brass water jacket.

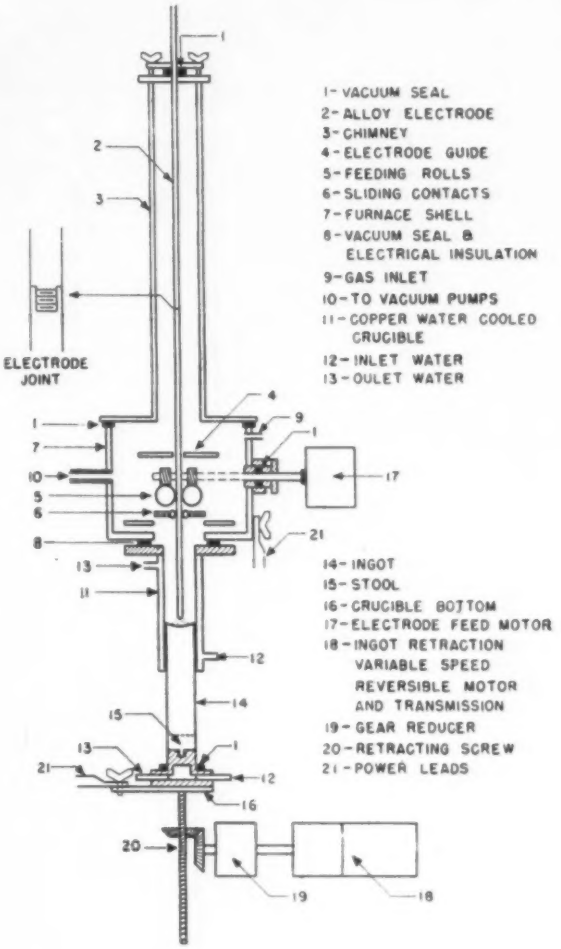

FIG. 2—Schematic of the furnace pictured in Fig. 1 details the salient features

ANALYSES OF DOUBLE MELTED INGOTS

Nominal Percent Composition (Bal. Ti)	Location In Ingot	Actual Composition
2 Al	Top	2.05 Al
	Bottom	1.92 Al
6 Al	Top	5.96 Al
	Bottom	5.91 Al
6 Al	Top	6.01 Al
	Middle	6.23 Al
	Bottom	6.19 Al
6 Al 1 Si	Top	6.11 Al 0.997 Si
	Bottom	6.52 Al 0.959 Si
8 Al 1 Si	Top	7.98 Al 0.977 Si
	Bottom	8.54 Al 1.04 Si

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The removable water-cooled copper crucible bottom is attached to the insulating fixture. A stool approximately 1½ in. thick of the same composition as the electrode is made in the nonconsumable furnace. A steel stud is threaded in one end of the stool and into the crucible bottom. This serves as the mechanical link between the crucible bottom and the ingot. The stool is of sufficient thickness to prevent the steel stud from being melted.

Prior to melting, the crucible bottom is rammed into place by the retracting mechanism. The system is evacuated and flushed with argon twice and then filled to a slight positive pressure of argon which is maintained throughout the melting operation. Melting is started by striking an arc between the lower end of the electrode and the stool which secures to the crucible bottom. The electrode is continuously fed to maintain a steady arc of 30 to 35 v and 1000 to 1100 amp. When the ingot has been built up to a length of 4 to 6 in., the retracting mechanism is turned on and adjusted to the rate of casting. The metal leaving the crucible is still at a red heat. The positive pressure of argon is sufficient to maintain a steady flow of argon around the hot ingot inside the crucible to protect it from contamination. The ingot leaving the crucible is slightly oxidized at the surface. The contamination is less severe than that during a normal forging operation.

Ingots up to 33 in. long and up to 3 in. in diam have been made in this furnace. It is believed that ingots up to 4 in. in diam can be made with the present available power. It has not been established how large ingots can be made when the power is doubled.

Homogeneity in double melted alloys has been checked by chemical analysis, see table. These results demonstrate that a good degree of homogeneity is achieved by the double melting process.

It is believed that ingots weighing up to 200 lb can be made in this furnace by increasing the diameter of the crucible. This will be done in the near future. The only limits on the size of an ingot are the physical limits on the distance that the ingot can be withdrawn and the diameter of the molten pool that can be maintained.

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[4] H. D. Kessler and M. Hansen, "A Study of Arc Melted Molybdenum—Rich Chromium—Molybdenum Alloys," Transactions, American Society for Metals, Vol. 42, 1950, p 1008.

ACKNOWLEDGMENT

The authors are indebted to B. R. Rajala, Asst. Metallurgist, for his contributions to this project.

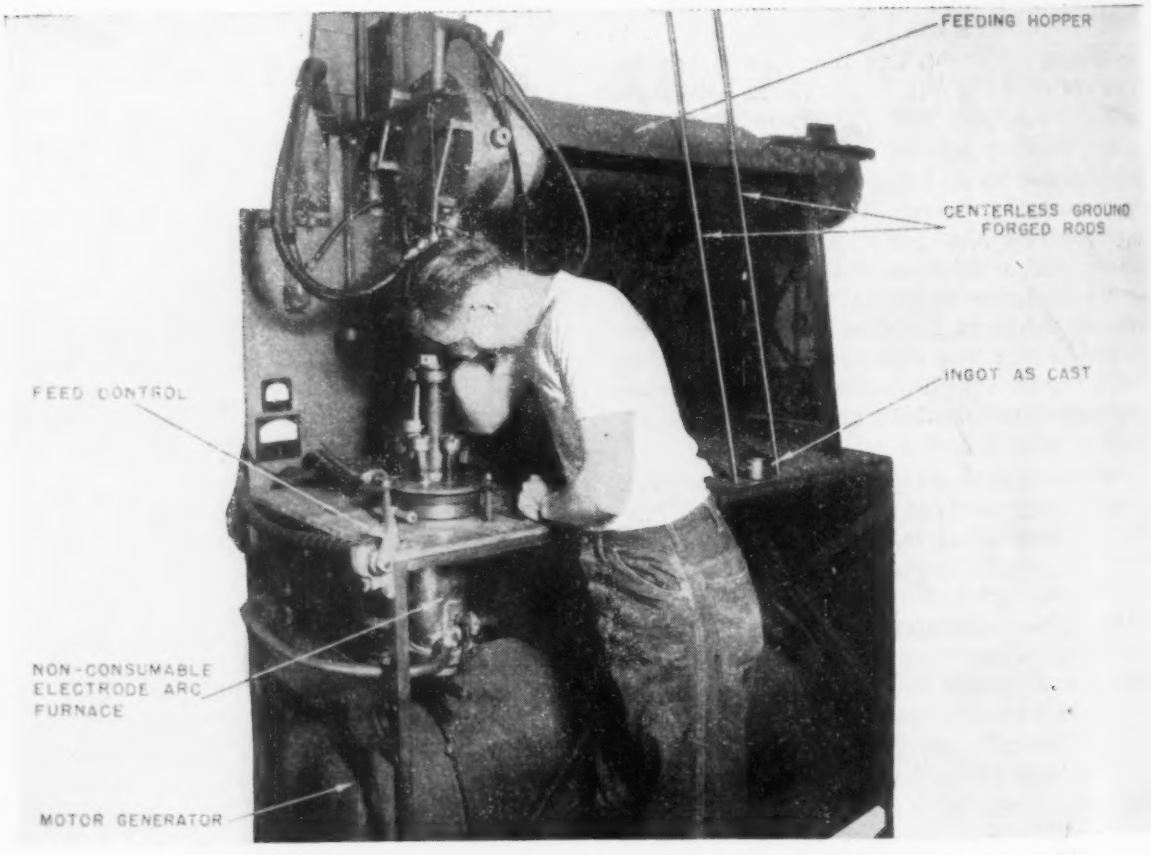

FIG. 3—An ordinary nonconsumable electrode furnace is used in the first melting.

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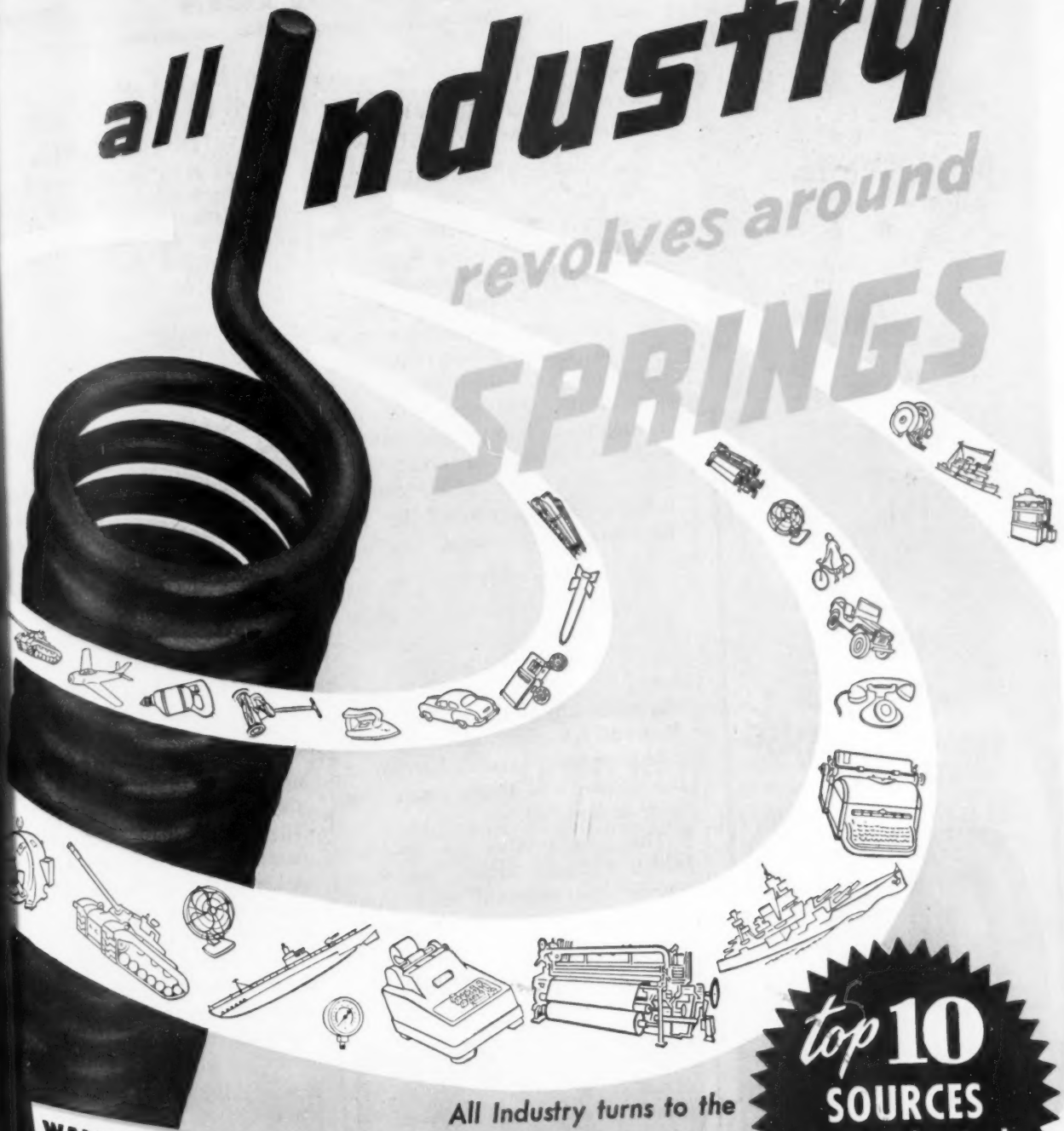

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Technical Briefs

METHODS:

Wire wrapping tool gives tight joints without solder.

A wire-wrapping tool, jointly developed by engineers of Bell Telephone Laboratories and the Western Electric Co., is said to produce, without the use of solder, a gas-tight joint between terminal lug and the connecting wire in the assembly of electrical, electronic and electromechanical equipments. The American communications industry makes an estimated 10-billion soldered joints each year which can be economically supplanted by this long-sought connecting method.

Use Air or Electric Gun

The tool for making these solderless connections is a hand-held gun, either air or electrically operated, that has a rotating spindle with an axial opening that receives the wire terminal and a smaller axial opening into which the skinned end of the connecting wire is inserted.

The gun rotates its spindle, which virtually shoots the wire around the terminal in a tight helix, making a firm mechanical metal-to-metal joint. Automatic positioning of the spindle facilitates loading; controlled tension makes highly uniform wraps.

Rectangular terminals, having sharp edges, are wrapped with about six turns of wire without the application of heat. Contact pressure in the finished connection is at least 15,000 psi which results in an indentation at each of the four terminal corners that requires a 10-lb force to strip.

Five Years Research

Solderless wrapped-wire connections took five years of intensive scientific research to develop. Thoroughly tested by Bell System engineers, the connection is mechanically stable, less apt to break through rough handling or vibration, and has an estimated life expectancy of 40 years. In manufacture, wire wrapping is faster, more uniform, and easier on the operator, than soldering.

IF YOU WANT MORE DATA

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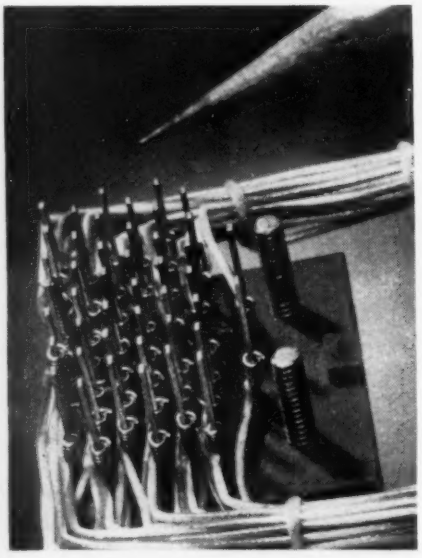
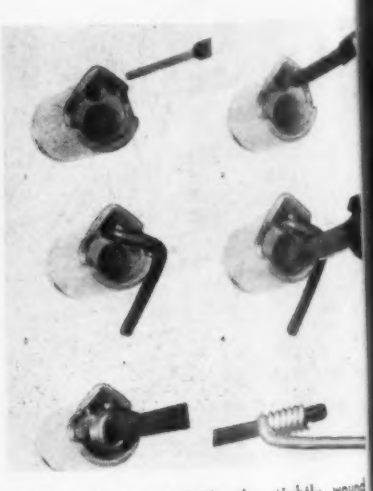


PENCIL POINT gives idea of size of assembly when wound wires are in place.



STEPS IN FORMING the tightly wound helix which forms the solderless joint are shown above. Wire is inserted, bent over, then wound about lug in power driven tool.

AIR AND ELECTRIC tools can be used with this new method of making solderless joints in some electrical applications.

Elimination of the soldering phase in assembly operations removes the disadvantages of stray solder droppings, "cold" joints and damaging of adjacent parts by heat. Clipping excess wire from a soldered connection, often a cause of trouble in wire equipment, is not necessary because the wire end is part of the connection.

Space Saver

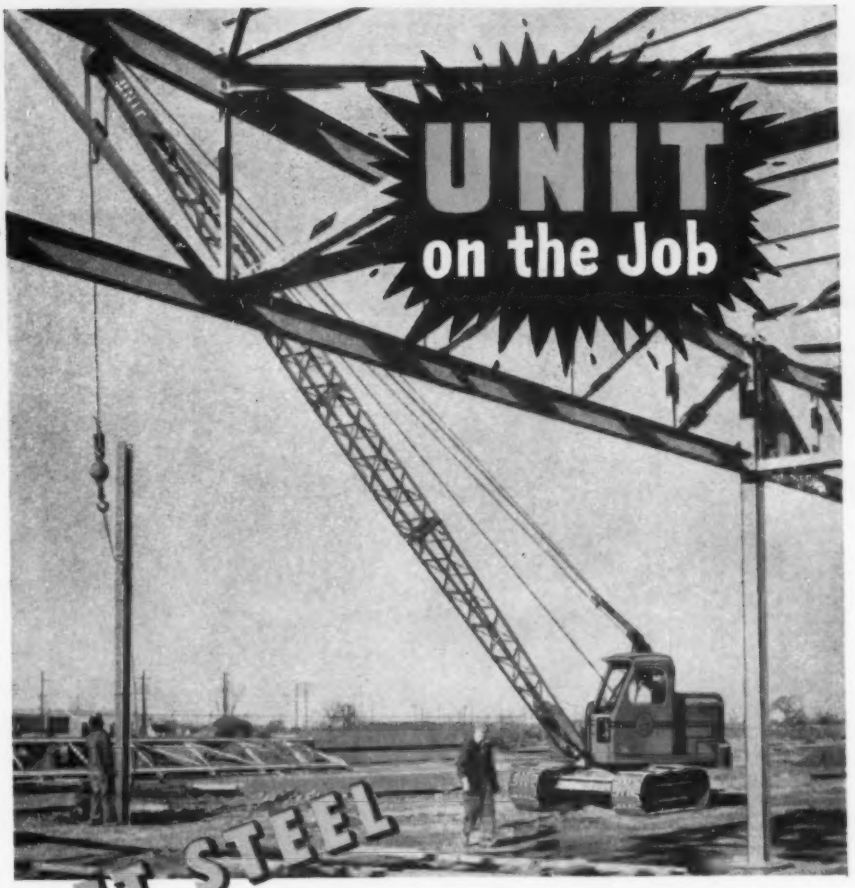
With the solderless connection, terminals can be made smaller in cross section, and spaced more closely together. Since the connection requires a minimum of space, equipment can, as a result, be reduced in size.

Although the Western Electric Company does not plan on producing the tool, it will be made commercially available to radio, television, communications and electrical manufacturing companies through licensed tool manufacturers.

Rubber Added to Metals Primer

A red lead metal primer which provides a tough, hard adhesive coating on galvanized metals, structural steel, iron, etc., has been developed by Foundry Rubber Inc. of Washington, D. C. Rubber in the primer adds greater resistance to galvanic corrosion, acids, alkalis, chemicals, corrosive gases, and moisture. It provides a tough, hard, moisture-proof coating with maximum adhesive qualities.

Turn Page



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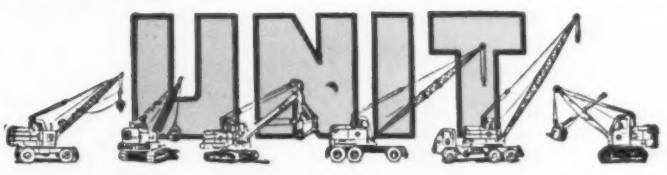

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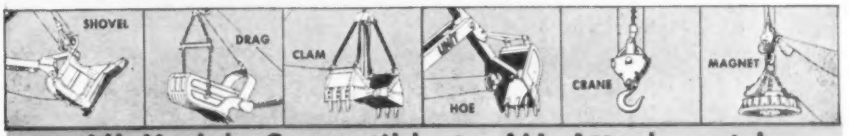

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—Technical Briefs—

MATERIALS:

Dielectric, physical properties improved in fiber glass tubing.

How to insulate a variety of remote control circuits hermetically sealed in gases proved a problem for Electro-Seal Corp. of Des Plaines, Ill. Breakdown of insulation cut the effective life of the circuits.

Takes Continuous Operation

Electro-Seal solved its problem with an improved fiber glass tubing made with a tough silicone rubber coated compound by General Electric Co. The new insulating material, produced by Bentley, Harris Mfg. Co., Conshohocken, Pa., is basically a braided fiber glass coated with the heat resistant silicone rubber dielectric properties and flexibility are improved.

Electrical and physical properties are unaffected by continuous operation through a temperature range of minus 90° to 400° F. It will also withstand 450° F for 96 hours, 500° F for 4 hours and 600° F for 15 minutes.

Around Sharp Corners

The silicone coating gives an average minimum electrical breakdown ranging from 7000 v for NEMA class H-A-1 to 1500 v for Class H-C-2. Electrical resistance is 100,000 megohms after 48-hour tests at 25° C and 50 pct relative humidity. The material can be twisted and bent without crazing or cracking or losing electrical strength.

The sleeving has proved successful for jobs mounted in small metal boxes. It can be dressed around sharp metal corners or pressed tight against metal parts in small enclosures required by the armed forces miniaturization program, the company says.

Protects Against Vibration

The sleeving protects Electro-Seal equipment against lead breakage commonly caused by prolonged frequency vibration. No residue gases or films are formed and the sleeving contains no foreign matter which might interfere with the precise mechanical parts or gaseous

Turn to Page 154

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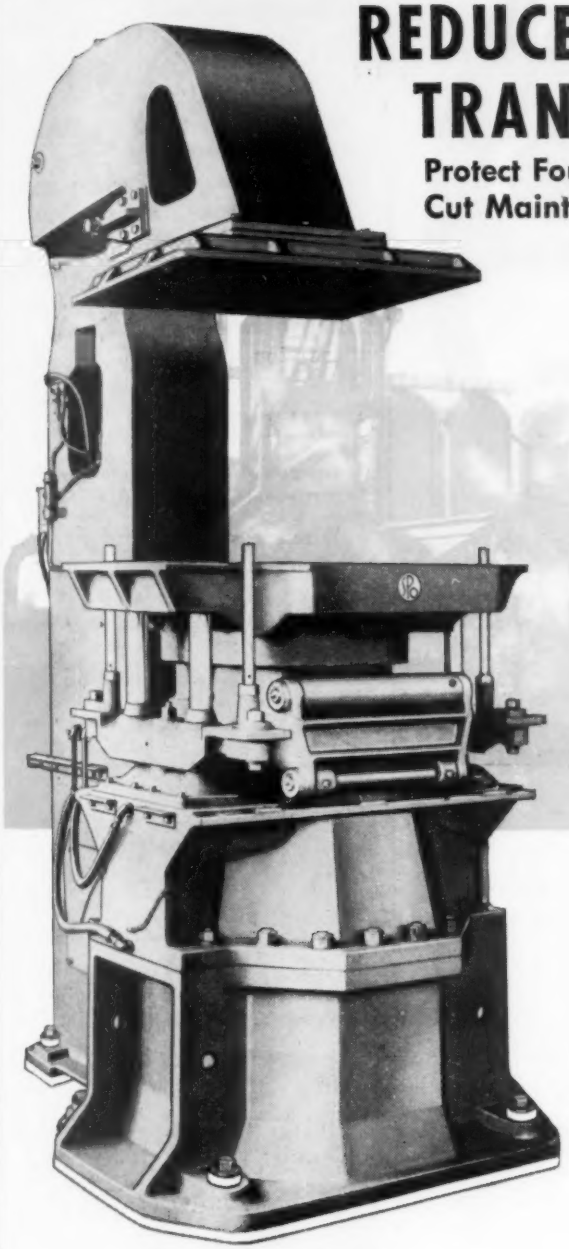

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Write for engineering data on over fifty different types of applications in the basic steel and metal working industries.

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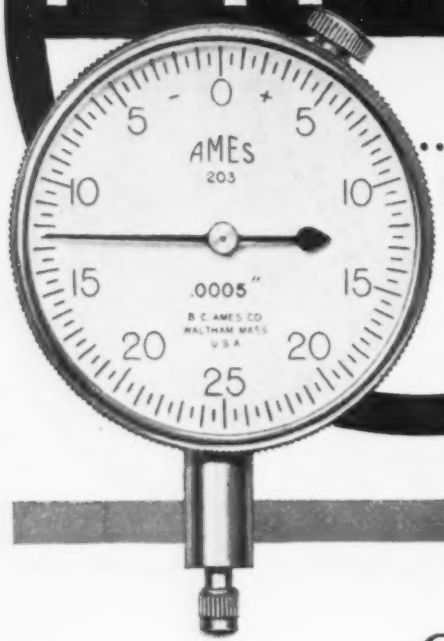


...the preferred Dial Indicators

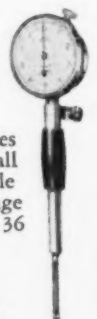
One of America's largest and most famous mass-producers recently chose Ames as preferred source of supply for indicator gauges.

The reasons behind this decision are the very reasons why *you* should standardize on Ames dial indicators and dial gauges:—the Ames "Hundred Series" indicators available in four sizes, fit every measuring requirement; they are *accurate, sensitive,* low in friction, yet are *rugged* and *tough*—give *more* on-the-job time. All Ames products embody latest design and highest-quality materials; they are manufactured by methods and machines that are *exclusive* with B. C. Ames Co.

Ames Dial Depth Gauge No. 11C

Ames Dial Micrometer No. 517

Ames Amplifying Dial Comparator No. 26



Ames Small Hole Gauge No. 36

Send today for your free copy of Catalog No. 58

Representatives in principal cities. B. C. AMES CO. *25 Ames Street Waltham 54, Mass.*

Mfgr. of Micrometer Dial Gauges • Micrometer Dial Indicators

atmospheres in which the relays are mounted.

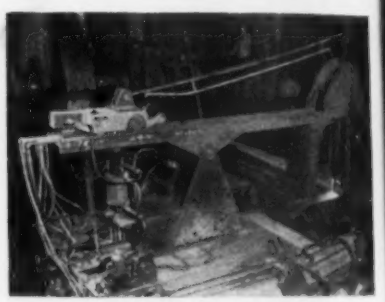
An added advantage is that the silicone does not melt, deform or outgas when accidentally touched by a hot solder tip.

In addition to imparting flexibility, test resistance and electrical strength to all types of glass cloth insulation, the SE-100 silicone rubber is useful as an encapsulating material for coils and cores, and as an impregnant for heater ducts, gaskets, seals and diaphragms. The material is available from General Electric as a base stock and as a dispersion (SE-100S).

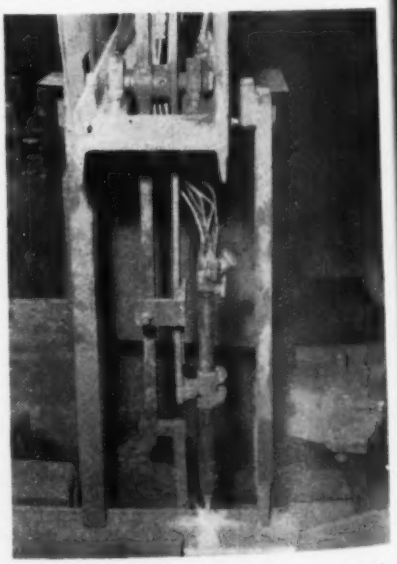
METAL CUTTING:

Equipment combined for semi-automatic cutting of forging steel.

When a customer of a leading steel mill ordered shell forging stock with square ends, the mill operators decided that the special



SHOP-MADE oxyacetylene bar cutting machine is used to cut 5¼ x 5¼ in. stock. Total cutting cycle is 20 seconds.



CUTTING BLOWPIPE, made from Oxweld unit, knifes through steel forging stock at 20 to 24 ipm.

Turn to Page 156

DETREX PHOSPHATE COATINGS

Your Paint Finish is on to stay!

...with Detrex PaintBond

Detrex PaintBond effectively retards corrosion and serves as an excellent base for paint finishes on metal surfaces. Easily and quickly applied by spray or immersion means, it will add years of life to your product's finish.

Detrex PaintBond is a zinc phosphate coating which chemically interlocks itself on the metal's surface. Thus the metal surface is sealed off from moisture and other causes of corrosion. Since this coating provides a fine-grained crystalline surface, it also serves as an ideal base for paint and locks it securely to the metal. If the paint finish is scratched, PaintBond retards corrosion . . . and even when the scratch penetrates the coating, any corrosion that takes place is confined to the scratched area only.

As manufacturers of PaintBond, metal cleaners, degreasing solvents, and the equipment, Detrex can supply the entire process required to meet government or individual specifications. Only Detrex provides this "start-through-finish" service. For more complete information, contact our local field offices, or write direct to **Detrex Corporation, Box 501, Detroit 32, Michigan.** P-1

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COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels—High Speed Steels Die Steels—Hot Work and Shock Resisting Steels Carbon Tool Steels.

TOOL COLUMBIA STEELS

Power TO FIT THE JOB

Power TO FIT THE MACHINE

WISCONSIN -POWERED Xpediter

Load 'er up, then move fast! The Xpediter, built by Kalamazoo Mfg. Co., Kalamazoo, Mich., carries 800 lbs. at speeds up to 8½ mph. POWER is a Wisconsin Heavy-Duty Air-Cooled Engine.

Today, almost every warehouse or plant needs and uses one or more cost-cutting pieces of Wisconsin-powered equipment. And a good reason for such acceptance stems from this fact: Every equipment builder can select the *right size* Wisconsin Engine because of the wide model range . . . single-cylinder, 2-cylinder or V-type 4-cylinder models, 3 to 36 hp. Because the engine is right for the job . . . it delivers better lugging power due to the best relationship of horsepower to torque.

Write today for a helpful booklet titled, "Which Engine Should Power Your Equipment?"

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

end preparation was a job for oxy-acetylene cutting. In order to fi this production order as quickly and as economically as possible available equipment was combined into an efficient production installation. A cutting blowpipe is used to make the cut, and is moved into the work zone on a machine carriage.

MOISTURE CONTROL:

Better control of humidity cuts honing tool rejections.

Excessive atmospheric humidity posed an unusual problem for a manufacturer of honing tools. High moisture content led to bond failures of abrasive sticks cemented to metal mounts.

To solve this problem, Micromatic Hone Corp., Detroit, installed a chemical absorbent dehumidifier air conditioning system to supply air to its stone mounting room.

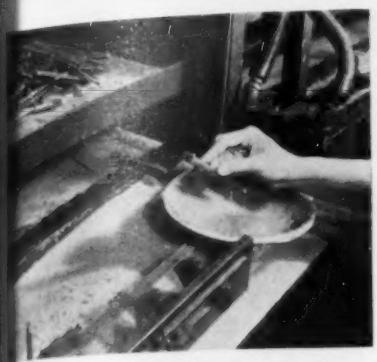
Rejects Ran High

Good abrasive sticks—mounts that will not fail—are of first importance at Micromatic, makers of honing machines, honing tools and abrasive sticks for honing. When rejects from the stick cementing operation were running as high as 50 pct on days of high humidity, it was essential that a remedy be found.

Micromatic's problem was to supply a low moisture content air to the stone mounting room as even small amounts of condensation on the abrasive sticks or their metal holders caused the cement to bubble, weakening the bond.

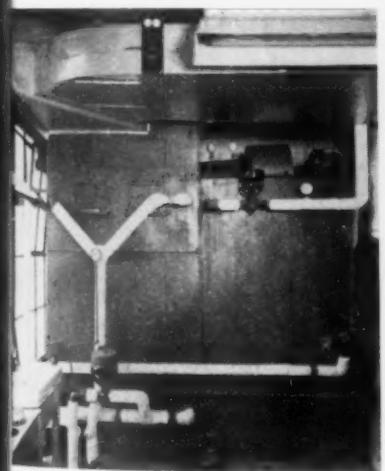
Accurately Controlled Air

A Surface Combustion Kathabar Humidity Conditioning Unit, designed to deliver automatically 3500 cfm of air containing only 30 grains of moisture at 82°F dry bulb temperature when maximum outside conditions would be 95°F and 110 grains of moisture, 20 pct relative humidity, was installed. Rejections of stone assemblies has been virtually eliminated.



OPERATOR DRAINS abrasive stick of surplus cement before placing in metal holder. When cemented, assembly is put on conveyor to drying tunnel.

STONE MOUNTING room seen from discharge end of drying tunnel. Moisture controlled air is introduced at both ends of drying tunnel and exhausted through center duct.



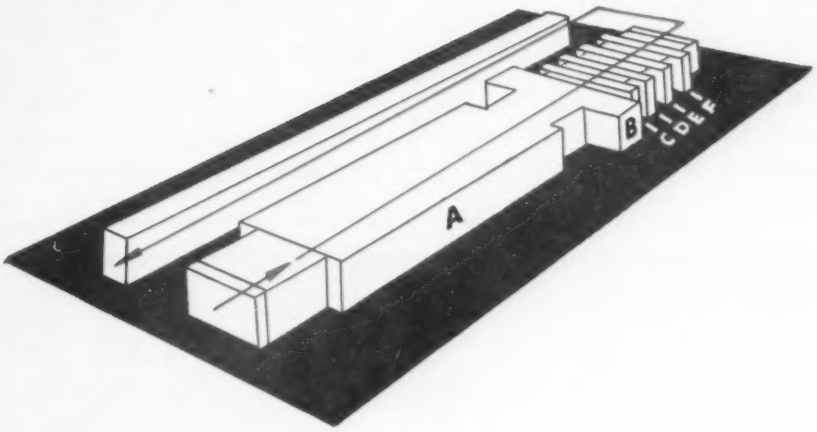
HERE'S THE UNIT, Surface Combustion's Kathabar, which controls moisture in air delivered to stone mounting room.

Because the air delivered has accurately controlled moisture content, the cement drying tunnel has been greatly speeded up, boosting production from 7000 to 15,000 stone assemblies without the use of additional floor space.

Turn Page

Heat Treat Furnace Layout

by Holcroft...2nd of a Series



A Annealing furnace
B Hot salt quench
C Wash
D Acid bath
E Wash
F Oil dip

Volume Production Castings
Annealed, Descaled, Desanded

This "U-type" furnace layout by Holcroft ties right into the production line of a large automotive plant.

The unit anneals, descales and desands 10,000 pounds of castings each hour. After annealing, the stock is dipped in a salt quench, rinsed in water, bathed in acid, water-washed again, and dipped into a soluble oil to prevent rust. A return conveyor automatically brings the trays back to the loading point.

Unusual layouts like this present no particular problem for Holcroft. After all, it's an inherent part of the job to be completely responsible for the work—from the time it is to be heat treated to the time it's ready for finishing operations. It's the type of work Holcroft does well. Holcroft & Company, 6545 Epworth, Detroit 10, Michigan.

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PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

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MATERIALS HANDLING:

Self-opening and closing sheet lifter cuts warehousing costs.

By enabling crane operators to pick up and deposit packs without waiting for men on the ground, a self-opening and closing automatic sheet and plate lifter saves labor, time and floor space.

The unit eliminates the delay as well as the labor cost of men climbing over stacks to pass chain slings or operate lifter manually. Craneman can pick from the high stacks or inside holes in stockpile as easily as from an outside row.

Less Space Between Stacks

In warehousing, only 8 in. space is needed between stacks instead of the usual 24 in. to 30 in. Material can be stacked to the limit of overhead clearance, saving from 25 to 50 pct of warehousing space.

LESS SPACE between stacks of sheet stock is possible with use of this unusual self-opening and closing sheet lifter.

With the lifter incoming material from cars or trucks can be unloaded to stockpile with only one man below to lay stringers between packs. Sliding guides align the lifter against edge of pack.

A hydraulic check valve, controlled from the crane cab, keeps the lifter from closing until positioned. Release of the valve permits the lifter to close by positive tong action when hoisted. The device opens and releases pack when laid down. Sheet stock up to 72 in. wide and 6 tons in weight can be handled.

Fuel Line Coupling Is Flexible

Increased efficiency and easier refueling are possible with a leakproof fuel-line coupling, now being installed in jet airplanes by Lockheed Aircraft Corp.

Developed by Lockheed engineers, the new coupling is flexible and won't shrink, swell, or shiver free under pressure, it is claimed. Old-style couplings frequently reacted to fuel by expanding or contracting, thereby deteriorating to the point of causing dangerous leaks.

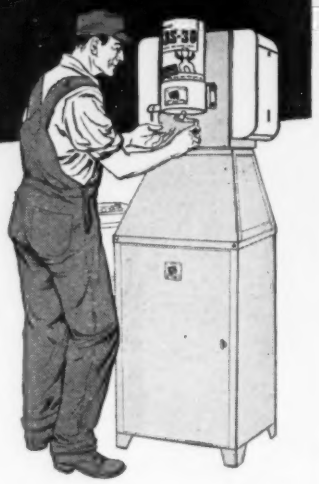
The new sleeve-and-O-ring fitting allows four degrees of bend in flight. This provides greater safety against fuel leakage in flight, even at three times the pressure encountered in current jet aircraft, tests show.

NEW SBS WATERLESS WASHSTATION*

"brings the washroom to the worker"*

for only $52.50 per unit

(F.O.B. Saginaw, Mich. Towel Dispensers not included)



SBS Waterless Washstations are complete units for hand washing on the job. Because they dispense SBS-30 Waterless Skin Cleanser, these Washstations require no plumbing . . . SBS-30 is simply rubbed on the hands and wiped off along with all the soil.

SBS Waterless Washstations—

- **In Trouble Spots** — Avoids workers use of irritating, harmful solvents. Quickly and safely removes tars, greases, paints, varnishes and other hard-to-remove soils.
- **On the Production Line** — Cuts to a minimum costly interruptions for hand washing.
- **Actually Earn You Money** — By eliminating one unnecessary trip per day for hand washing by only 10 men, you can save up to $720 annually.

Fill out and mail coupon below for complete information about SBS Waterless Washstations and our 30-day no-risk money back trial offer.

*Trademark

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SUGAR BEET PRODUCTS CO., Dept. 7A, SAGINAW, MICHIGAN

Sirs: Please send me full information about the new SBS Waterless Washstation and your 30 day no-risk money back trial offer.

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SUGAR BEET PRODUCTS CO. • Saginaw, Mich.
Chemical By-Products Division

MAINTENANCE:

Cut costs here with modern scaffolding, rolling towers.

Despite close control of maintenance costs in most manufacturing plants, one of the commonest causes of operating waste is building maintenance!

Many modern plants still use ladders, hand-made wooden scaffolding and other "expedient" equipment. These have a high annual replacement cost. In other departments, management makes every effort to provide modern, time saving machinery.

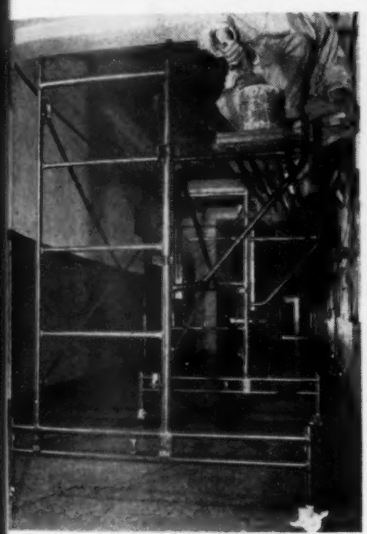
Take Lamps, For Instance

Similarly, lamps are replaced bulb by bulb at a high labor-unit cost. Time studies have repeatedly shown that mass replacement based on bulb life expectancy is often cheaper.

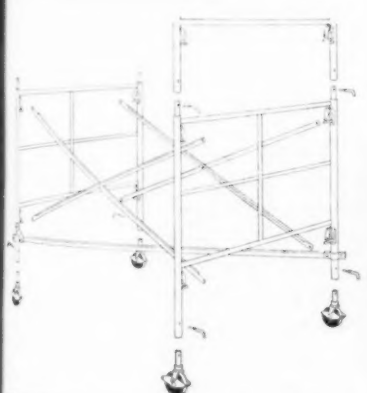
Probably the greatest savings in maintenance are gained by using modern scaffolding equipment which combines maximum working efficiency and greatest safety, with lowest possible replacement cost. The Wilson-Albrecht Co., Inc., national manufacturer of steel scaffolding in Minneapolis, Minn., has devoted thousands of research hours to engineering this type of equipment. Rolling towers and ladders recently designed represent some of the biggest advances in maintenance scaffolding design in recent years.

Must Be Fast, Sure

Elementary to the design of modern maintenance scaffolding is



LADDER FRAME 29 in. wide, mounted on 5-ft wide extension equipped with side brackets, enables painters to adjust speedily to various working levels.



EXPLODED VIEW of base section of Waco rolling tower. Speedlock connections and built-in coupling pins give fast, sure joints between frames and cross braces.

Turn Page

The safety of your employees and the public is good enough reason to install walking surfaces of slip-resistant J&L Jal-Tread floor plate.

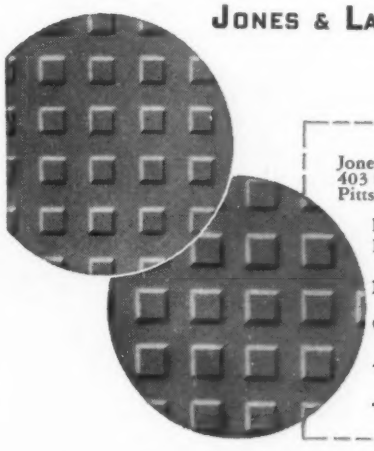
But here are some other important advantages you'll get when you specify Jal-Tread, the only true checker-board floor plate.

- Reduced worker fatigue from feet rocking on uneven surfaces.
- No wheel shimmy in hand industrial trucks.
- Neat appearance . . . easy draining and sweeping in any direction.
- Easy fabrication—square design allows cutting without shearing through raised cleats . . . permits welding joint of uniform thickness.
- Easy cold-forming on standard equipment.

Mail the coupon for more information today. You'll find J&L Jal-Tread will pay off in greater safety . . . lower maintenance costs.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PA.



J&L STEEL

Jones & Laughlin Steel Corporation
403 Gateway Center
Pittsburgh 22, Pa.

Please send me your free booklet on J&L Jal-Tread.
Please have your representative call.

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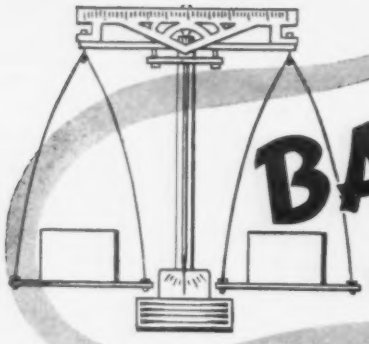


BALANCED FOR EASY WHEELING!

Equipped with steel wheel or wheel with zero pressure or pneumatic tire.

You'll find it so easy to wheel heavy loads in Sterling Barrows. Only a minimum of effort is required. Sterling's perfectly balanced construction permits 80% of the load to be carried on the wheel . . . only 20% by the operator. This increases efficiency . . . allows more loads to be hauled each day . . . reduces hauling costs.

ORDER NOW!

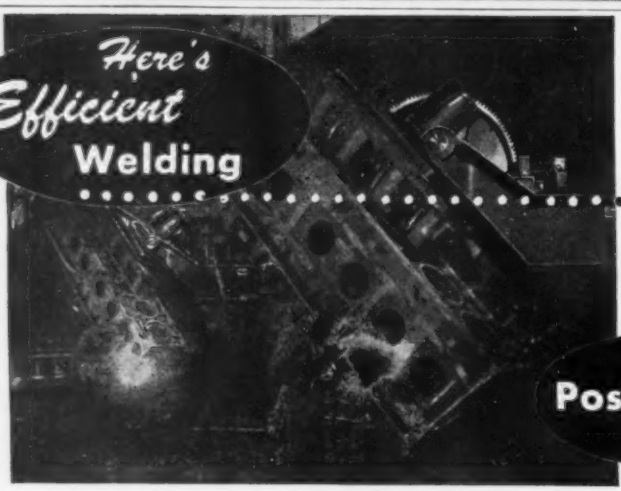
DEALER PLAN AVAILABLE. WRITE FOR DETAILS.

Model C5W with Pneumatic Tired Wheel and Wood Frame.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS



Here's Efficient Welding ..... On C-F Positioners

When heavy, unwieldy weldments like these diesel crankcases can be quickly swung into any position so that every weld is made *downhand* —that's efficient welding!

Welders spend more time welding—do better welding at lower cost when they work with C-F Positioners because these hand and/or power operated machines reduce positioning time to a minimum. Investigate the cost-saving advantages of C-F Positioners. They pay their way in any company.

Write for Bulletin WP24—an illustrated circular detailing the *Specific* advantages of C-F Positioners.

CULLEN-FRIESTEDT CO.
1303 S. Kilbourne Ave., Chicago 23

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

C-F positioned welds mean better, more economical welds

a fast, sure locking device to secure cross-braces to end frames. One of the largest manufacturers of this type equipment, Wilson-Albrecht Co., Inc., has developed a patented Speedlock to do this job.

This lock works in conjunction with built-in ladders, pivoted cross braces and floating coupling pins. With these a rapid tailoring of the basic equipment to meet the requirements of each type of maintenance job is possible.

Put Your Crew On Wheels

With a Waco rolling tower a maintenance crew has a combination tool that quickly adapts to ceiling heights, working levels, narrow entrances and similar variations.

Where necessary for a number of men to work at a single level, more frames and braces can be added horizontally. Use of the "Speedlock" and other modern scaffolding features can save up to 75 pct on erecting and dismantling, as compared with conventional wooden or "wing nut" scaffolding, it is estimated.

MACHINING:

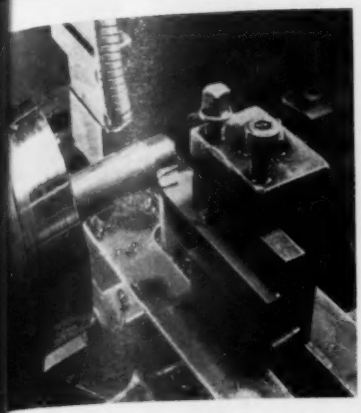
Carbide inserts help cut costs of machining stainless forgings.

Tool cost savings of approximately $7 per thousand parts produced, plus additional savings resulting from minimized tool changing and grinding time have been attained in a Midwestern manufacturer's plant by using indexable square carbide inserts for rough turning forged 321 stainless steel jet engine nozzles. The operation is now done at 1/20 the previous tool cost.

Heretofore the operation was handled with a brazed carbide tool at 0.0045-in. feed, 150 sfpm and 0.093-in. depth of cut. Best tool life was 50 to 60 pieces per grind or a total of 640 pieces per tool. Under this setup, tool cost per piece was $0.0071.

Speed Boosted

Using Kennametal tungsten carbide square insert tools, 325 to



ROUGH TURNING forged stainless steel jet engine nozzles with vertically clamped square insert tool. Total tool life is 32,400 pieces.

350 pieces are turned per cutting edge at a feed of 0.003 ipr. Depth of cut is 0.093-in. at 1480 rpm and 490 sfpm.

Lathe used in the operation is a No. 3 Warner and Swasey of 10 hp. With four cutting edges available on each end of the clamped insert, an average of 2700 pieces are machined between grinds. Since about 1/32-in. of stock is removed from each of the insert's ends in regrinding, estimated number of pieces per insert is 32,400.

In running a comparative cost analysis, the producer found that with tool holder formerly used, tool cost per piece averages about 1/28 of a cent. To turn 32,400 pieces with a brazed tool would have required approximately 50 tools at $4.55 each.

Expand Production of Argon Gas

Increased demands for argon, especially in welding applications, have led to expansion of production facilities by Houston Oxygen Co. Their new $1 million plant at Houston, Texas, the only one in the South, works in connection with the company's liquid oxygen and nitrogen production.

The 0.9 pct argon which the air contains is removed by a series of rectifying, filtering and compressing operations. Crude argon is funneled into a giant balloon suspended from the roof. From there it goes to a purifying plant. On leaving the purifier, the argon is 99.92 pct pure.

Turn Page

At Portable Electric Tools, Inc., Chicago, costs went down 25% when this Delta air-powered hydraulic drill unit went into production on body housing of PET ¼" portable electric drill.

Portable Electric Tools, Inc.

Cuts Production Costs 25% with DELTA Air Hydraulic DRILL UNITS

Portable Electric Tools, Inc., of Chicago combined two model 19-150 Delta Air-Powered Hydraulic Drill Units and a standard Delta drill press table to build a simplified, single-purpose production machine. Their aim was to increase unit production and cut operating costs.

The principal operation performed on this machine is the simultaneous boring of two brush holder holes in the PET "Super-Duty" ¼" portable drill body. Exacting accuracy is required because these holes are then used for locating the part for all other machining operations on the aluminum castings.

HERE ARE THE RESULTS:

"The Delta hydraulic drill unit has given us more than 25% production savings," says Walter Sundberg, Superintendent of Production Machining.

Tolerances held are plus .0005 and minus .0000.

Average output per hour, 150 bodies. No mechanical, service or maintenance problems, even when the machine has run three shifts for long periods.

Women workers with no previous experience operate the machine.

WHAT'S YOUR SPECIAL PROBLEM?

Delta air-powered hydraulic drill units can do for you what they've done for Portable Electric Tools, Inc. Your authorized Delta drill unit dealer will show you how to cut costs with this low-priced, high accuracy, high production drill unit. Our Catalog suggests many applications. Use the coupon.

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DELTA QUALITY MAKES THE DIFFERENCE

DELTA Quality Power Tools

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KRANE KAR

SWING-BOOM MOBILE CRANE

CAN SWING IT!

SWINGS AND TRANSPORTS LOADS OF ANY SHAPE OR SIZE ANYWHERE IN YOUR PLANT

1½, 2½, 5 and 10 ton cap.

You don't have to face the load . . . swing the boom! It's live and handles up to 10 tons at either side. You can swing materials from a RR car right onto a waiting truck; reach into a boxcar and load it; stack piles two-deep and three-deep on both sides of aisle, increasing storage space; move loads into plant through low shop doors; work in narrow aisles and congested areas where other equipment cannot operate.

Only *KRANE KAR* can do such difficult materials-handling jobs *ECONOMICALLY* because 1—it transports full rated load; 2—tops and lowers boom by power; 3—lowers load by power; 4—has automatic crane braking at limit positions; 5—has good vision; 6—excellent traction and short turning radius; 7—gas-powered, it can work 24 hours a day.

Use *KRANE KAR* as a standby for bigger cranes and for emergency maintenance and repairs. *ASK FOR BULL. 89—STEEL, Metalworking and Metalproducing Industries.*

SILENT HOIST & CRANE CO. 851 63rd ST., BROOKLYN 20, N.Y.

THOMAS *Heavy Duty*

BILLET SHEARS

for long and distinguished service

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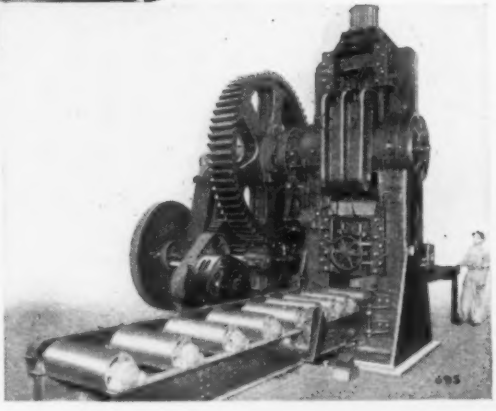


THOMAS *Heavy Duty* Billet Shears are built in capacities from 500 to 2000 tons, with the primary objective of delivering to the user many years of efficient, trouble-free service. *And they do!*

Write for Bulletin 311

PUNCHES • SHEARS • PRESSES

BENDERS • SPACING TABLES

THOMAS

MACHINE MANUFACTURING COMPANY

PITTSBURGH, 23, PA.

—Technical Briefs—

INGENUITY:

Novel use for conveyor belting found in handling abrasives.

Once in a while a methods engineer strays afield and finds just the material he needs being used for a totally different purpose. That's what happened to Behr-Manning Corp. of Troy, N. Y.

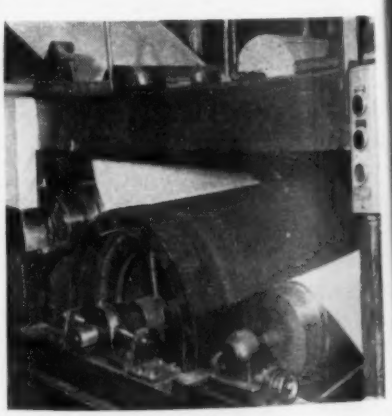
Engineers at BM wanted a better material to control movement of abrasives during their application to backing material in the manufacture of coated abrasives. They found their answer in rubber conveyor belting made by Thermoid Co. of Trenton, N. J.

Must Control Abrasives

This special material, ordinarily used to convey packages up an incline, has thousands of gripper points molded into its surface to prevent slippage of the packages as they move uphill.

In the manufacture of coated abrasives, proper winding of the stock through rollers is essential as it passes through the various processing steps. For instance, after the backing material gets its coating of grain and bond, it must be dried in long ovens.

The rollers covered with the conveyor belting control the movement of the abrasive stock as it passes continuously from backing to drying. The rubber belt not only prevents undesirable slippage between the rolls but stands up longer than materials previously used.



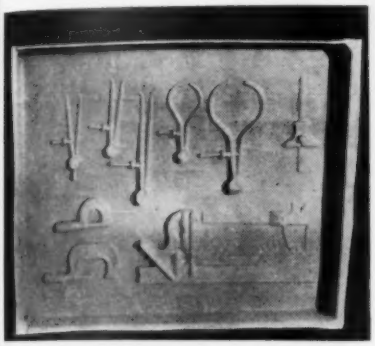
RUBBER CONVEYOR BELTS embossed grippers made the belt just right for use in controlling movement of abrasive materials during application to backing.

CONTOUR PACKAGING:

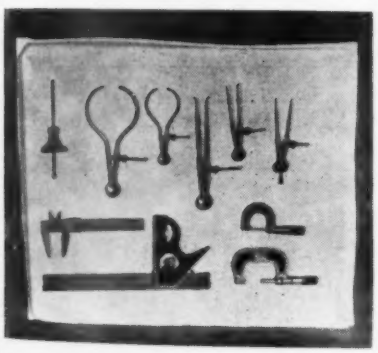
Vacuum forming gives new protection to machinists' tools.

Protection plus sales appeal have been added to machinists' tools and other industry small tools through development of improved machinery for contouring packaging.

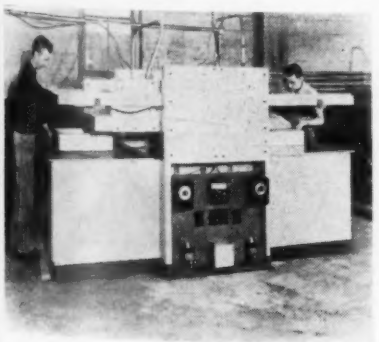
Leader in development of vacuum forming machinery for contour packaging is Auto-Vac Co. of Fairfield, Conn. Essentially a combination of heat and pressure, the vacuum forming method brings new efficiency to forming thermo-



PRECISION INSTRUMENTS in a vacuum formed contour package. The instruments are completely immobilized in a shock-absorbing casing.



SAME PIECES, placed on under side of package, are almost completely enclosed.



VACUUM FORMING machines handle a range of sheet sizes from 17 x 21 in. to a sheet of 28 sq ft.

and another sagging market gets a boost from . . .

General Packaging Laboratories

Quincy Stove Company, Quincy, Illinois, faced an actual drop in sales when their Monogram Oil Heaters started arriving at dealers' in a damaged condition. They presented their problem to General Box Company Engineers. Results:

- A Watkins-Type container, specifically designed to withstand heavy punishment and meet Pre-Tested Safe Transit Standards, was developed.
- The product itself was tested on General Box Company's exacting laboratory equipment; improved design corrected cause of failure.

In the three years since the changes were made, Quincy Stove Company's damage in shipment claims have totaled less than $200.00. This is only one among many packaging problems solved every day—at a saving—in General Box Company's two fine Industrial Packaging Laboratories.* Let us help *you* cut packing and shipping costs. Write today for full information.

Find out how other manufacturers are cutting packaging costs. Write for your free copy of "The General Box."

*General Box Company Laboratory facilities are certified to make "National Safe Transit" tests

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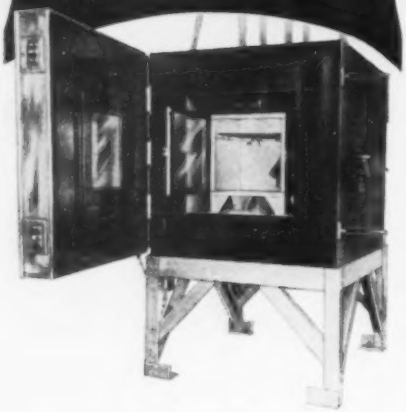
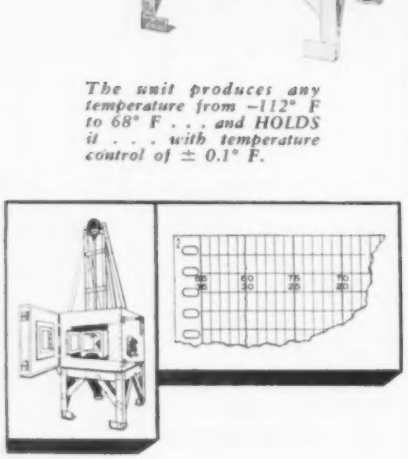
Another BOWSER First . . . . . the NON-MAGNETIC CHAMBER



The unit produces any temperature from −112° F to 68° F . . . and HOLDS it . . . with temperature control of ± 0.1° F.



Stray magnetic fields can be a big headache in the development testing of pure metals. But not in this new chamber engineered by Bowser.

Used in determining effects of temperature on electrical fields, this Bowser non-magnetic chamber does not contain an ounce of steel that could hamper testing. It is constructed entirely of brass, copper, aluminum, rubber, bakelite, glass, wood and Fiberglas. All motors and electrical components are located over 6 feet away to eliminate effects of their electrical fields.

A special inner chamber thermally governed by vernier control is a double guarantee of testing accuracy.

For all your needs in environmental test equipment, be sure to check with Bowser — the pioneer. A field engineer will be glad to discuss your needs (at no obligation).

BOWSER TECHNICAL REFRIGERATION

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—Technical Briefs—

plastics, reproducing shapes with a speed, low unit cost, and fidelity that cannot be matched by older forming methods.

Adds Sales Appeal, Too

Applied to the packaging of precision instruments, the primary need for protection is filled. But, because of the contour fit, sales appeal can be added to what otherwise would be a drab collection of instruments.

Reproducing shapes faithfully, vacuum forming allows the instrument to be snugly imbedded in its container, affording a maximum safeguard against physical damage.

Preprinting, the technique of applying decorative or informative matter to the plastic before it is formed, gives vacuum forming a big economy advantage over laborious hand decoration.

Get 3-D Effects

A distorted image is imprinted on the sheet; after the forming operation, the decoration is perfectly registered. Figures, faces, and various kinds of deep embossing are thus given an accurate three-dimensional aspect.

This ease of decoration with practically unlimited shape possibilities has led to the use of vacuum formed packages for a wide range of products, including machine parts.

Handles Many Plastics

Polystryrene, modified styrenes, polyethylene, acetate, butyrate, and all vinyl polymers have been successfully shaped by vacuum forming.

Sheets varying in thickness from 0.001 to 0.125 in. can be vacuum formed without noticeably affecting the basic strength of the material. Sheets of almost any size can be vacuum formed. The smallest standard machine takes a sheet 17 by 21 in. However, the Auto-Vac recently delivered a machine which vacuum forms a 28-sq ft sheet in a single operation.

The larger machines permit application of the contour packaging method to a wide variety of products produced by industry.

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VERTICAL PLATE LIFTING CLAMP
This universally used plate lifting clamp has built its reputation through tough and dependable service. It is designed for jobs where safety and sureness really count. Plates can be lifted to or from horizontal.

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HORIZONTAL PLATE CLAMPS
These clamps are sturdily constructed so as to handle sheet or plate singly or in layers.

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Excellent lightweight hook for lifting plate, beams, structurals, pipe, etc.

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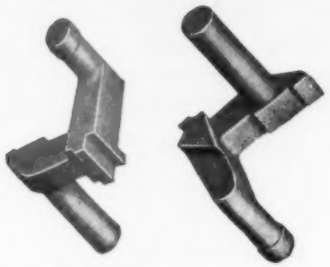

Castings pass
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Material: Alloy Steel AISI 8620

THE ILLUSTRATION SHOWS A PAIR OF LEVERS USED IN A HIGH-SPEED GUN BREECH MECHANISM

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—Technical Briefs

STEELMAKING:

Pittsburgh Steel's new Allenport mill has unusual "nerve system."

Close to 500 miles of electric conduit lie beneath the spanking new concrete floor of Pittsburgh Steel's new Allenport, Pa., plant. They hold the slender nerves and power life-lines linking every corner of one of the nation's most modern steel installations.

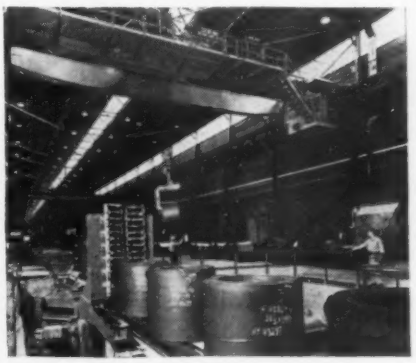
So the entire mill may work as an integrated unit, a vast network of wire enclosed in steel pipe was required. The Harlan Electrical Construction Co. installed 325,000 feet of pipe before the concrete floor was poured at the big new plant.

The $28 million plant contains one of the fastest semicontinuous hot strip mills in the world. Complementing this is a 500-ft continous pickle line. The hot strip mill can produce steel sheets at the rate of about 1770 fpm.

Heavy Power Demands

Close to 2500 hp in electric motors is required for the operation of the new pickle line and to drive the three motor-generator sets used. Motors and motor-generator sets were supplied by the Reliance Electric & Engineering Co., Cleveland, whose engineers worked with Wean Engineering Co., Warren, Ohio in designing the strip propulsion drives and controls for entry, processing, and delivery sections of the line.

Current limit accelerating and



THIRTY-TON Cleveland crane handling coils of strip steel from down-ender and turntable of conveyor to temporary storage before trip to pickling line.

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decelerating controls applied to the regulators permit maximum rates of acceleration and deceleration.

Since the entry end of the line must be stopped for (1) shearing the heads and tails of coils, (2) welding and flash trimming, or (3) stitching to form a continuous ribbon of steel, accelerating and decelerating times are important.

Some Must Stops

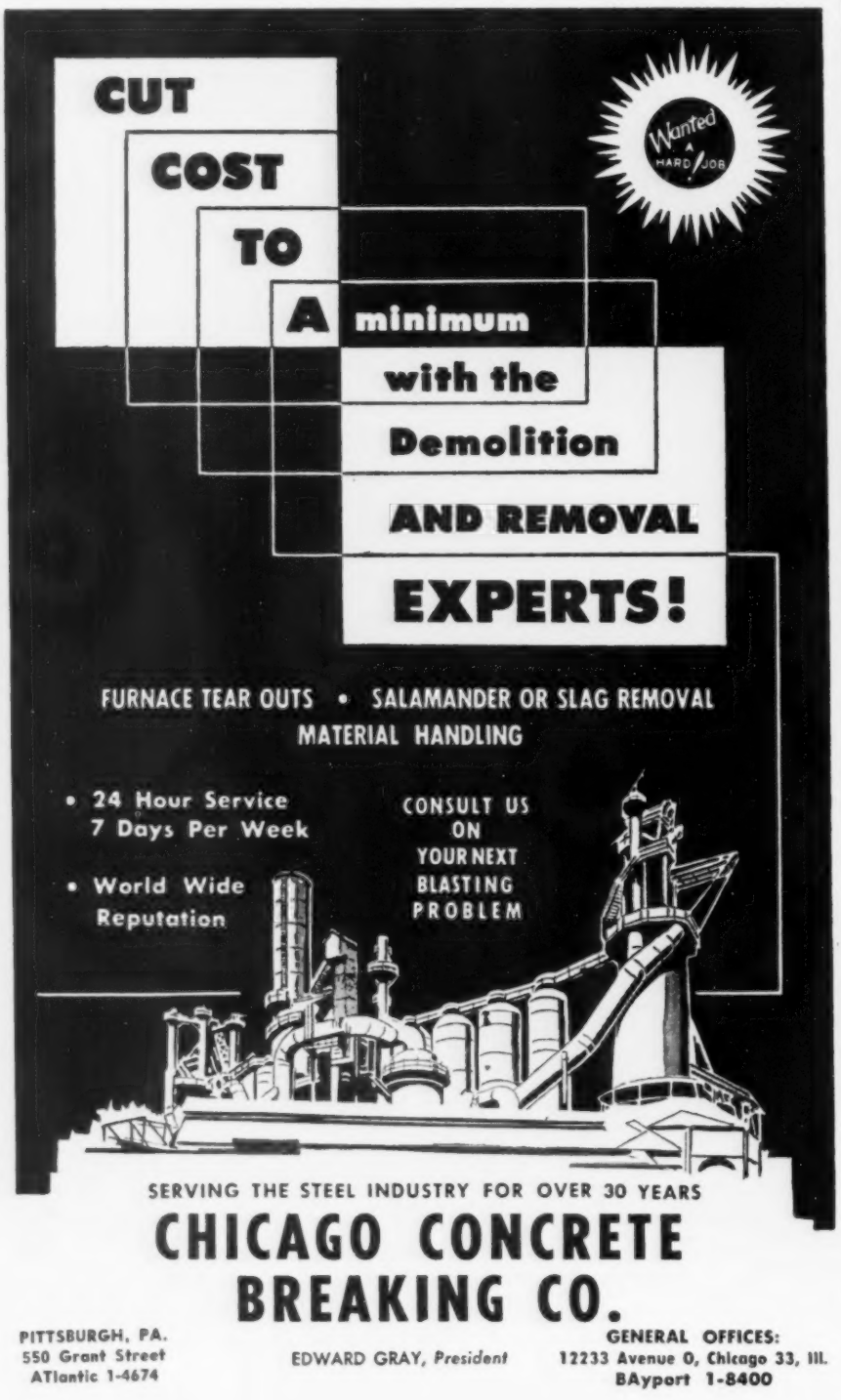
On the delivery end of the line, it is necessary to start and stop the movement of the strip for shearing out stitches and for kicking out completed coils. Because long welding times have been eliminated, overspeed requirement for this end of the line is obtained by over voltage application to the motors in this section from the delivery section generator.

From Stitcher to Storage

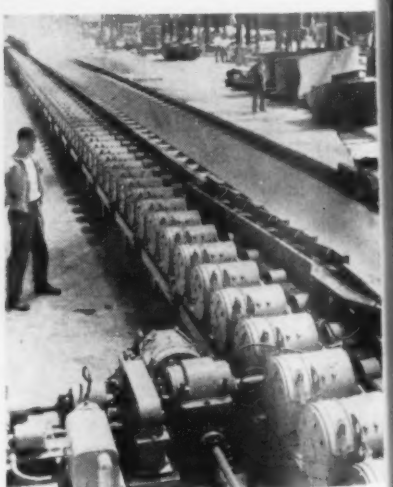
Strip is fed into the line from a stationary mandrel built as a part of the processing uncoiler. The strip then passes through stitcher pinch rolls driven by a 75 hp, DC motor. These pinch rolls are the final stage of the stitching process in which the leading edge of one coil is secured to the tail end of another.

Into Four Pickling Tanks

Immediately following the stitcher pinch rolls is a storage or looping pit from which strip



MAZE OF CONDUIT looked like this before concrete floor was poured at Pittsburgh Steel's new Allenport, Pa. plant. Pipes carry power and electric control lines to many points in mill.



BANK OF MOTORS on new hot strip mill, they're GE 3-hp units, gives idea of many electrical power units required in mill.

can be fed continuously into four pickling tanks.

The strip is pulled through the pickling tanks by a pair of follower or exit pinch rolls. Immediately following is a second storage pit to permit an accumulation of strip while shearing out stitches and removing the completed coil from the upcoiler.

Handle Coils to 30 Tons

Strip is trimmed to width, oiled and recoiled to a maximum diameter of 6 ft and a weight of about 30 tons.

Fifteen Cleveland overhead traveling cranes will be used for handling materials in the new mill. Fourteen of these are new and include all-welded steel construction throughout and direct-current drives with magnetic controllers.

Cranes Speed Materials

Seven of the cranes are in operation in the hot mill. Seven others will serve the cold mill. They range in capacities to 60 tons. Most of them have spans running over 80 ft.

Particularly outstanding is the Cleveland single-leg scarfing gentry crane in the conditioning department. This has a ram-type hoist which eliminates the usual swinging of loads of conventional cable or rope type hoists.

No Line Shafting

Equipped with two magnets on the ram, the gantry crane handles the heavy slabs in the area it serves and turns them over from one side to the other, enabling the scarfers to clean and prepare them quickly, ready for rolling.

The crane is unusual in that no line shafting or other mechanical connectors between the bridge drives at both ends of the crane is employed. Each end truck is individually motor driven. This method of driving the bridge eliminates many bearings and considerable gearing and is an important factor in reducing maintenance to a minimum.

Orinoco Has Unusual Laboratory

A completely equipped laboratory to handle the analytical and assay work at the newly developed mine of the Orinoco Mining Co., in Cerro Bolivar, Venezuela, has recently been designed by Sam Tour & Co., consultants, New York.

The laboratory—from personnel to pulverizers to pipettes—can, if necessary, operate 6 months without additional supplies.

This degree of self-sufficiency is required because the mine, being located in interior Venezuela, 55 miles south of the Orinoco River, is too remote to receive frequent delivery of supplies.

Turn Page

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Rutted ground or high grade highway . . . equipment mounted on CARAVAN axles is ready to roll over any surface. These quality-built assemblies assure positive trail at high speeds as well as stability for the heaviest equipment over the roughest ground.

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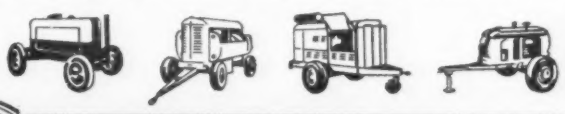
CARAVAN units are available as single-axle two-wheel assemblies and as four-wheel running gear equipped with automotive type steering. They are recommended for mounting military and industrial equipment as well as field service and construction machinery weighing up to 14,000 lbs.

Write today for the new Bulletin No. 53 for further information.



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MACHINE TOOLS:

Variable tilt shaper cuts time for machining form blocks.

Thousands of manhours a year will be saved Ryan Aeronautical Co., San Diego, Calif., with a new variable tilt shaper which slashes seven-eighths of the time required to machine form blocks.

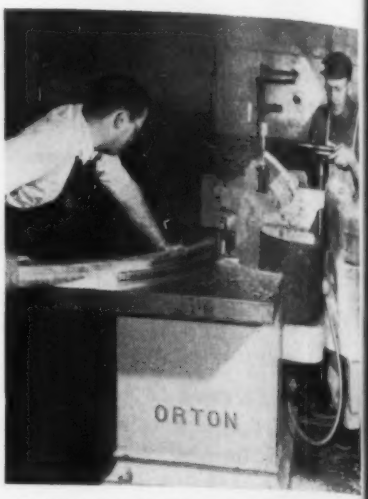
Designed and built by the Orton Machine Co., San Francisco, the $6000 tool tackles one of the most tedious and time-consuming jobs in the aircraft industry. This is the machining, to varying angles, of the edges of cast aluminum form blocks used to fabricate bulkheads, frames, gussets, ribs and many other structural parts for aircraft. Ryan makes hundreds of these form blocks each year so that the savings which will be realized will reach substantial proportions.

Form blocks are slabs of cast aluminum alloy which are placed in hydraulic presses to act as the bottom dies against which the aluminum sheets are forced by the descent of the press's rubber-faced ram.

Since the parts formed must fit into aircraft which have tapered fuselages, wings and other components, the edges of the form blocks have to be cut to varying angles. Usually, the form blocks are 2 in. thick and the angle of the edges changes constantly, but not uniformly, along their entire contour.

Old Method Time Consuming

Heretofore, no machine has been available for cutting the edges and the form blocks have had to be made by hand. First, the slab was cut out with a band saw, using a steel template to outline the cut. Then, the template was attached to the form block and it was filed by hand to conform with the template markings.



ALUMINUM CHIPS FLY at Ryan plant as operators use novel variable tilt shaper to reduce time in machining form blocks.

This method involved a laborious process of filing and constantly checking the results with a protractor. Accuracy depended upon the skill of the workman. A typical form block, such as that used to make the door ribs for the Boeing C-97 stratofreighter, required 3 days to file the edges.

Now Done In 3 Hours

With the new variable tilt shaper, this job can be turned out in only 3 hours. Two men operate the machine. One feeds the form block into the rotating cutter while the other turns a large control wheel which changes the angle of the cutter as the work progresses.

Success of the machine is due to its unusual design. A vertical cutter is suspended slightly above the surface of a steel table by means of a circular mounting. The cutter head unit and 5 hp electric motor are mounted on an outer quadrant which slides over an inner quadrant on bronze ways. The inner quadrant is mounted on the frame of the machine.

Close Control Possible

By turning a control wheel which actuates a worm gear and pinion, the outer quadrant can be rotated over the inner quadrant. No lock is required to maintain its position because of its substantial design.

The cutter head unit is so located that the top edge of the cutter is at the exact center of rotation of the outer quadrant. Con-

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sequently, as the angle of the cutter is changed, the top edge remains stationary and the cutter rotates around the point where the top edge contacts the form block. In this way the angle of the machining can be varied precisely from an exact line which is the top contour of the form block.

As the work is machined, one operator continuously adjusts the

CLOSEUP OF TILT SHAPER shows arrangement for tilting cutter, pilot guide, and wheel control which slides outer quadrant over inner quadrant.

angle of the spinning cutter by bringing the pointer on the machine's protractor scale into conformity with the readings indicated on the template.

Accuracy Very High

A guide, mounted on the non-tilting inner quadrant, is located immediately above the cutter. The other operator feeds the form block into the cutter by bringing the template against this guide which is in full view.

The machine will cut any angle from 45° under to 30° standing. An adjustment on the inner quadrant is provided which raises or lowers the point of rotation of the cutter so that blocks up to 6 in. thick can be machined. Practically any shape of block can be processed as long as it is of uniform thickness.

Accuracies obtained are exceptionally high because the circular mounting of the machine magnifies the operator's control. A slight change in the angle of the cutter, which would not be perceptible to the eye, is easily observed on the protractor scale which is a segment of a very much larger circle.

HEAT CONTROL:

Robot-eye units monitor uranium rolling at AEC plant.

Radiation detection devices which literally "see the heat" comprise the heart of a newly developed robot system that's 10 times faster and 2 to 5 times more accurate than previous systems in monitoring critical temperatures during uranium rolling operations, it was reported recently.

The new system, developed by the Minneapolis-Honeywell Regulator Co., automatically supervises this vital phase of production rolling of uranium ingots. It has been installed in the recently opened uranium mill built by Birdsboro Steel Foundry & Machine Co., Fernald, Ohio. The AEC's Ohio production center is now in volume production rolling uranium into ingot bars later used to produce fissionable materials.

"Pick Up" Elements

Objective in designing the system was to improve accuracy of temperature measurements important to uranium and other rolling processes. The radiation devices, called radiamatic pyrometers, function as "pick-up" elements which are comparable to electric eyes.

They detect the temperature—or heat—of the uranium ingot and relay the information to a series of electronic recording instruments. This information, which may report temperature conditions at several points in the production line, permits a single operator to make necessary adjustments.

By conventional procedures mill operators determine temperatures by utilizing colored crayon sticks, each with specific melting points.

The new system, by permitting measurements while the ingots are being processed, markedly speeds up the production operation.

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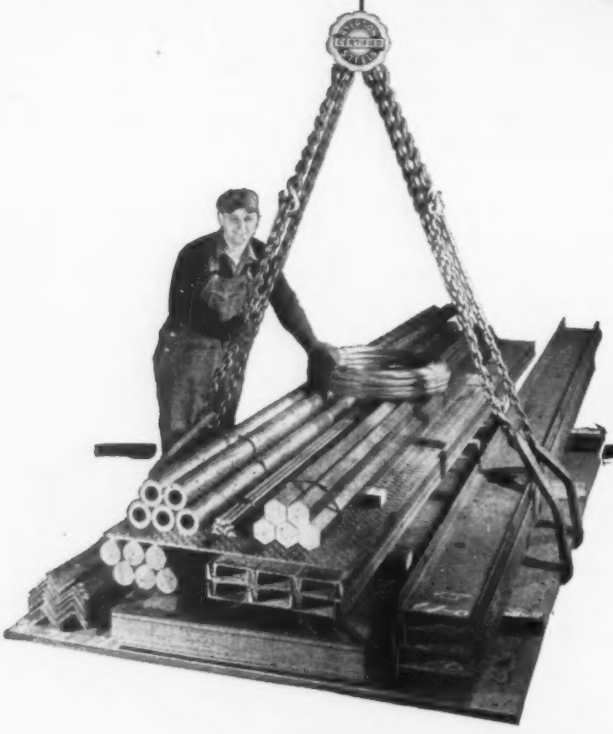

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Auto Demand Turns Spotty But Market Stays Tight

Auto makers aren't pressing quite so hard for steel . . . They are especially cagey about orders after October . . . But most consumers want more steel than mills can offer them.

Record steel production in the rst half of this year is reflected sharply higher earnings. An ON AGE compilation of earnings 21 steel producers accounting or the bulk of the industry capac- shows these comparisons:

Industry earnings in the first alf of 1953 were approximately 5 pct higher than they were dur- the first half of 1952. Opera- ons during the first half of 1953 eld consistently at high levels, hile the 1952 period was plagued 54-day strike which shut down e bulk of the industry.

Good Results . . . Earnings for e second quarter of 1953 were 42 pct higher than they were dur- the first quarter of 1953.

Increases in steel extra and base rices had little effect on earnings r the first half. But they indicate even brighter profit picture for ost companies in the second half. Most companies raised extra prices rly in May, so they were effec- ve for only a third of the first alf year. The increase in steel ase prices following the wage in- rease (effective June 12) also ises the earnings potential but his may be whittled down by umulative cost increases result- g from the wage-price boost.

Market Eases . . . This week the teel market is a little easier. But ou never would believe it after alking to some steel users. They hink statements that "the steel hortage is just about over" are a t of bunk. Consumers won't be- eve the shortage is over until hey can place orders for all the onnage they want. That day is till somewhere in the nebulous uture.

Predictions of approaching balance between steel supply and demand are not quieting the troubled waters of relations between steel companies and their customers. While the predictions appear valid enough, steel company salesmen ponder the unhappy task of answering letters from customers confused by fourth quarter quotas lower than any they had received so far this year.

Quotas Smaller . . . Fourth quarter quotas are smaller because of large carryovers of undelivered orders from third quarter. Major producers are running 3 weeks or more behind on deliveries. Some mills are as high as 6 weeks behind on certain products. One producer is already overbooked for fourth quarter and will have a substantial carryover into the first quarter of next year—unless it gets some cancellations.

With small, premium priced producers the picture is different. They are not booked to capacity and are actively seeking more fourth quarter business. But even high cost producers report very few cancellations. Tonnages that have been cancelled were speedily "rescued" by other eager consumers.

Autos Ease . . . Steel's biggest customer, the auto industry, is exerting a little less pressure this week. One mid-western mill had its first large cancellation when an independent auto maker cancelled all orders for fourth quarter. The firm later called and said it would take 60 pct of its original fourth quarter orders. The auto company has cars coming out of its ears. The cancellations will have no effect on available steel in the area.

Auto demand can't weaken to any great extent as long as General Motors and Ford keep pushing production higher and Chrysler—even with some stretchouts of production schedules—keeps going at a good rate. Worth watching, however, is reluctance of auto company purchasing agents to make commitments past October. Also fourth quarter model changes are bound to lower steel consumption.

Military Eases . . . Military cutbacks, or stretchouts, are being felt at mill level. Most noticeable change is in demand for alloy steels. Cancellations have resulted from cut-backs in tank and truck production. Automotive customers have also cancelled or held up some alloy orders.

There have also been some cancellations of certain types of shell steel. A fairly healthy cut-back in cartridge case material may be announced soon. Large rounds for projectiles are still in short supply.

Although some steel people express disappointment in demand for farm equipment and home appliance industries, they are not receiving cancellations. Farm equipment makers are exerting even more pressure for delivery and appliance manufacturers continue to take every pound shipped them.

Ingot Rate Up . . . Steelmaking operations this week are scheduled at 97.0 pct of rated capacity, up 4 points from last week's revised rate.

After many weeks of steady strength the scrap market turned down this week. THE IRON AGE steel scrap composite price declined 34¢ to $44.58 per gross ton. Prices in most areas are steady, with inventories large.

UNIVERSITY OF MICHIGAN LIBRARIES

DUCTILE IRON GEARS provide *Superior Strength* with *Excellent Resistance to Wear*

Large Gears... such as these Ductile Iron girth gears drive large tube mills in the cement and mining industries. Put into service without heat treatment, they normally provide 92,000 to 100,000 psi ultimate tensile strength, 3 to 5% elongation, and 270-290 BHN on the tooth surface.

In addition to excellent castability, ready machinability and moderate cost, Ductile Iron offers properties that are vital in a gear material.

For along with high strength and measurable ductility, Ductile Iron "as cast" combines good resistance to wear and galling, with superior values for notched endurance limits.

Ductile Iron can be heat treated to provide tensile strengths of over 150,000 psi. It develops surface hardnesses of over 600 BHN after flame or induction hardening. Service data show also that annealed Ductile Iron develops impressive properties which result in peak performance.

Ductile Iron can provide a chilled, carbidic, abrasion-resistant surface supported by a tough ductile core. No other single material combines these properties. Still another advantage is its ability to damp out vibrations that otherwise might build up stresses to dangerous levels.

Send us details of your prospective uses, so that we may suggest a source of supply from some 100 authorized foundries now producing Ductile Iron under patent licenses. Request a list of available publications on Ductile Iron . . . mail the coupon now.

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Please send me a list of publications on: **DUCTILE IRON**

Name_____ **Title**_____

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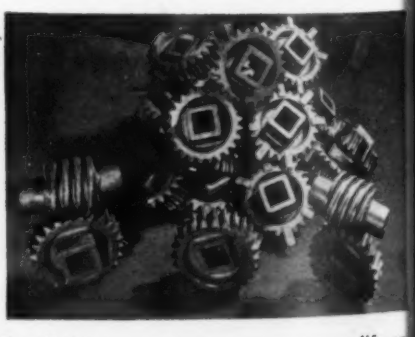


Small Gears . . . also worms . . . exemplify an application of Ductile Iron in the railroad field.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Market Briefs and Bulletins

Melt Titanium Scrap . . . A process for remelting titanium scrap has been developed by metallurgists of Allegheny Ludlum Steel Corp. and Titanium Metals Corp. of America. Efforts of the industry to recycle scrap had previously proved fruitless. Development is important because ultimate use can now be made of the approximately 30 pct of titanium metal which previously had to be considered waste. The new process should eventually unlock these stocks of waste titanium. Melting capacity is not a bottleneck in the industry.

Stainless Output Up . . . Stainless and heat resisting steel production reached a new high level in the first half of 1953 at 594,203 net tons, according to American Iron and Steel Institute. This was an increase of 104,958 tons over the second half of 1952 when the previous record was made despite the effect of the steel strike. It is 181,617 tons more than in the first half of 1952. Strikes interfered with the production in both halves of last year.

More Titanium . . . Production of titanium sponge is to be boosted by 6000 tons annually by 1956, under terms of a new government contract. Defense Materials Procurement Agency this week signed a contract with Cramet, Inc. of Chicago, calling for annual production of 6000 tons of titanium sponge at a plant to be built near Nashville, Tenn. Cramet's plant is to be in partial production by early 1953 and in full production in 1956.

Freight Rates Stay . . . Interstate freight rates are now slated to remain at current levels through 1955. Interstate Commerce Commission last week authorized railroads, freight forwarders and some water lines to extend for 22 months beyond next Feb. 28 the temporary 15 pct rate increase that has been in effect since April, 1952. Carriers had asked ICC to make the temporary increases permanent.

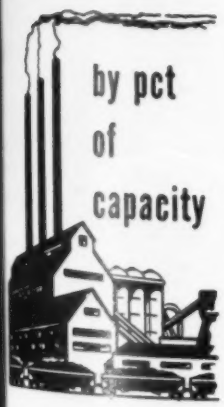
New Plastic Sheet . . . A new continuous process for making plastic sheet was introduced in New York and Chicago last week by Campco Div. of Chicago Molded Products Corp. The process is said to permit rapid production of light, strong, rigid sheets at lower cost. Sheet is made by forcing plastic made of polysterene and rubber through a heated die. No painting, finishing, or processing is needed on surface of sheets thus produced.

Raise Conductor Prices . . . Kaiser Aluminum and Chemical Sales, Inc., has raised prices on bare aluminum electrical conductor effective July 28, 1953. This adjustment reflects the recently announced price increase of basic aluminum and steel core wire as well as higher operating costs. There is no increase in the base price of covered aluminum electrical conductor in mill quantities.

Canadian Steel Tight . . . Some easing in supply has appeared in the Canadian steel markets but no surplus stocks are available. Steel people report steady demand and intimate there will be a large backlog of unfilled orders to be carried into fourth quarter. Despite record production scheduled by Canadian mills demand is absorbing all available supply. Any prospect of slowing will be reflected in lower imports rather than in curtailed demand from domestic producers.

Strategic Goods . . . New government restrictions prohibit U. S. residents from helping Communist-dominated countries to get their hands on strategic materials, no matter what the originating point of the goods may be. Previous export laws, which continue in effect, bar Americans from assisting Soviet-bloc nations in buying this country's critical items. As part of its Foreign Assets Control program, Treasury has now supplemented the export laws by prohibiting participation in the supply of strategic goods to a Communist country from a third country.

STEEL OPERATIONS

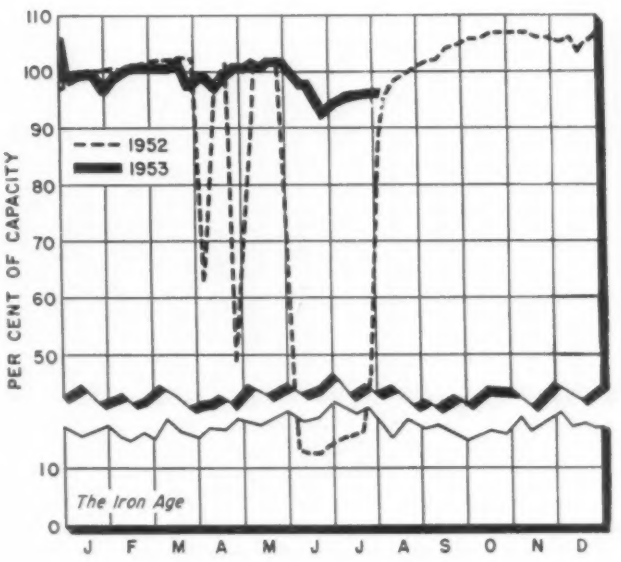


District Operating Rates

	Week of Aug. 2	Week of July 26
Pittsburgh	96.0	96.0*
Chicago	100.0	90.0*
Philadelphia	98.0	98.0
Valley	99.0	97.0*
West	105.0	100.0*
Cleveland	98.5	98.5*
Buffalo	106.5	106.5
Detroit	106.0	99.0*
Birmingham (South)	95.5	98.0
Wheeling	100.0	100.0
South Ohio River	95.5	92.0
St. Louis	102.5	93.0
East	103.0	103.0
AGGREGATE	**97.0**	**93.0**

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



UNIVERSITY OF MICHIGAN LIBRARIES

Copper, Brass Markets Turn Sticky

Ingot makers and smelters trim prices . . . Labor contracts expired in Chilean mines . . . Uncertainty keeping custom smelters out of scrap market—By *R. L. Hatschek.*

Biggest nonferrous news last week was the sticky copper and brass market. First, a leading brass and bronze ingot maker cut prices ¼¢ to 3½¢ per lb. Principal reasons were soft ingot demand, good scrap inventories and lower prices for tin and tin scrap.

Later, a major custom smelter cut his price ¾¢ to 29¢. Other smelters have yet to follow suit, are holding the line at 29¢ to 30¢ delivered Connecticut Valley. Mine producers are not likely to take any action immediately, as the Chilean price picture gets more and more confused.

Contracts Run Out . . . To thoroughly stir things up, labor contracts expired last Friday at Anaconda's Chilean mines. The company says it cannot grant miners' demands of a 75 pct pay hike plus the 15 pct boost ordered by the Chilean government. Either an adjustment in exchange rates or some form of tax relief are essential if the union's demands are to be met, Anaconda spokesmen say.

Meanwhile, the Chilean government is standing firm on its price of 36½¢ per lb. But the Iron Curtain countries' offer to barter for the red metal apparently didn't look too good to the Chileans when they realized that the goods offered for swapping would be given a highly inflated price by the Reds.

Scrap Slow . . . It could be the Chileans remembered how Hitler flooded some Latin American Countries with aspirin and similar items on barter deals. In any event, Chile is still trying to sell the U. S. But American trade feeling is that Chile will have to get competitive to sell here.

One effect of the whole situation has been to keep most custom smelters out of the scrap market completely. Scrap prices are down a penny a pound in many cases, but lack of business makes most prices largely nominal at the present time.

Resume Free Trading . . . To further harass the trade, London Metal Exchange resumed free trading in copper this week. A good-sized drop in price from the British government level of 31½¢ seems assured.

Main reasons include surplus overseas production, soft European demand and substantial stocks now held by British Ministry of Materials.

Lead Soft . . . Lead demand has slipped badly since the price hit 14¢ New York about 2 weeks ago. Consumers bought briskly when the price was climbing, but since then have been more cautious.

One factor is a pick-up in volume of scrap lead battery plates moving into refining plants. Big lead users claim now that August and September business will be good. But they don't deny a feeling of caution about inventories.

Tin continued sickly last week. Saturday closing quotations approached the lows set the Monday before. Singapore and London trading was suspended until August 4 because of a bank holiday, and U. S. sellers were hesitant to act until the overseas trading was resumed.

Pricing Slows Sales . . . Zinc has remained dazed from the pricing changeover. There have been three distinct pricing levels, with business reported from each group. Several sellers are still quoting Prime Western at 11.00¢ East St. Louis, and they have given no indication of switching to a delivered basis in the immediate future.

Overall demand continues light. Consumers are apparently marking time until the pricing situation is clarified.

Early this week American Zinc Sales Co., distribution subsidiary of American Zinc, Lead & Smelting Co., announced it will continue to sell on an f.o.b. East St. Louis basis. The company will absorb freight in excess of 50¢ per 100 lb for Prime Western, select, brass special and intermediate grades. Consumers' first reaction was confusion.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in July, based on quotations appearing in THE IRON AGE were as follows.

	Cents Per Pound
Electrolytic copper, Conn. Valley	28.839
Lake Copper, delivered	30.125
Straits tin, New York	81.59
Zinc, East St. Louis	11.000
Zinc, New York	11.67
Lead, St. Louis	13.48
Lead, New York	13.68

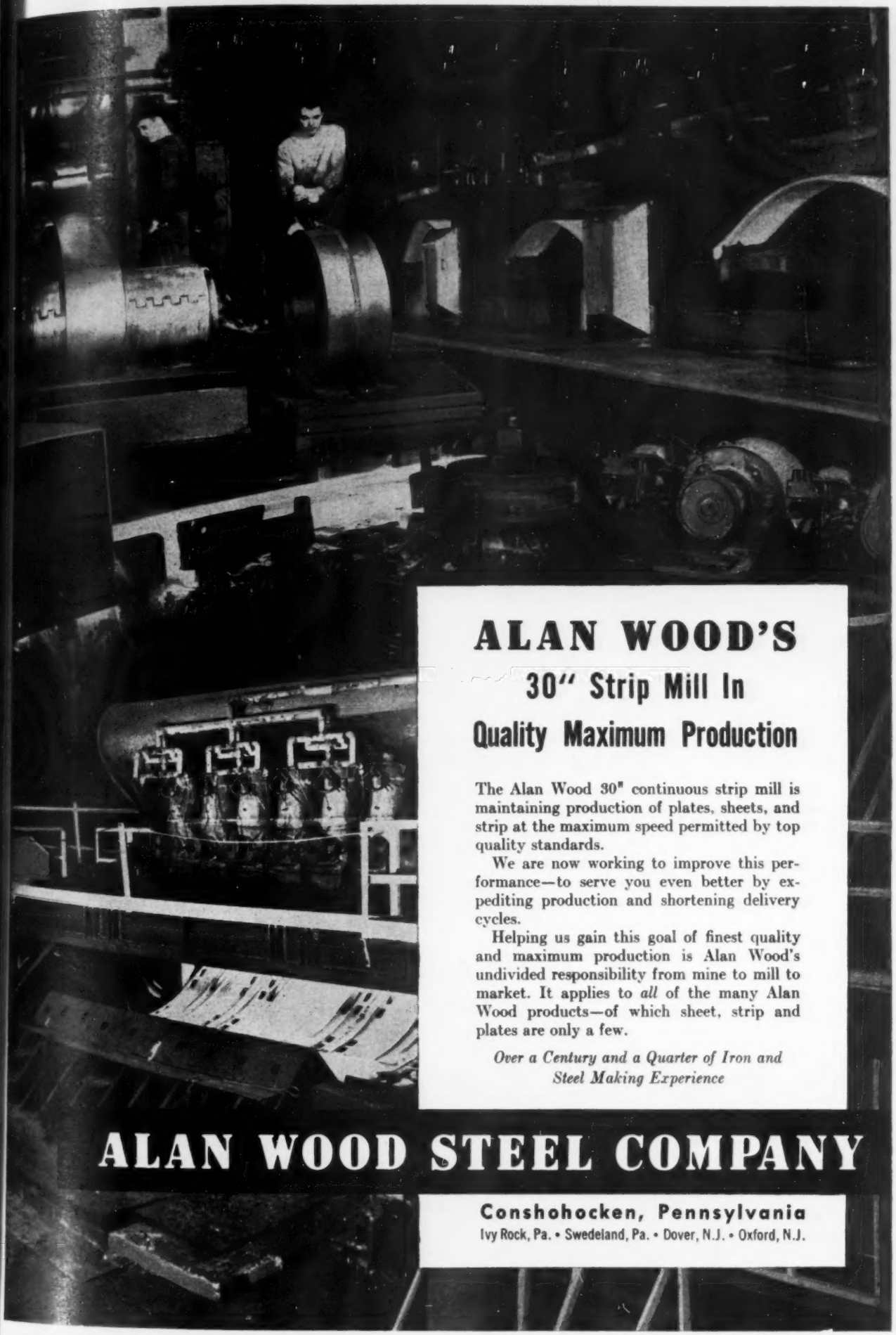
NONFERROUS METAL PRICES

(Cents per lb except as noted)

	July 29	July 30	July 31	Aug. 1	Aug. 3	Aug. 4
Copper, electro, Conn.	29.75–30.00	29.75–30.00	29.00–30.00	29.00–30.00	29.00–30.00	29.00–30.00
Copper, Lake, delivered	30.125	30.125	30.125	30.125	30.125	30.125
Tin, Straits, New York	79.75	78.50	78.25	78.25	78.25	78.25*
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices.

*Tentative Note: Revised tin prices: July 25, 78.75; July 27, 78.75; July 28, 79.25.



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The Alan Wood 30" continuous strip mill is maintaining production of plates, sheets, and strip at the maximum speed permitted by top quality standards.

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Nonferrous Prices

(Effective Aug. 4, 1953)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136-in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.2¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢. 0.081-in. 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢. 0.032-in. 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, ¼-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 37.4¢ to 82.8¢; 12 to 14, 38.2¢ to 99.0¢; 24 to 26, 40.9¢ to $1.29; 36 to 38, 48.4¢ to $1.89.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.499-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32-in. 59.6¢ to 47.0¢; ⅜ to 1½-in., 46.6¢ to 43.8¢; 1 9/16 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼ to 2 in., 41.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¾ x 60 in., $2.838; x 96 in., $4.543; x 120 in., $5.680; x 144 in., $6.816. Coiled sheet, per lb, 0.019 in. x 28 in.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 66¢; 3/16 in., 68¢; ⅛ in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ⅝ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢. Other alloys higher. Base up to ⅝ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅝ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall: OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless Tube	115½	100½	137½
Shot, blocks		60	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	48.51		50.58
Copper, h-r	50.48	46.83	
Copper, drawn		48.08	
Low brass	45.99	45.68	
Yellow brass	42.87	42.56	
Red brass	47.11	46.80	
Naval brass	47.01	41.07	42.33
Leaded brass			39.95
Com. bronze	48.76	48.45	
Mang. bronze	50.73	44.62	46.18
Phos. bronze	70.50	70.75	
Muntz metal	44.91	40.47	41.72
Ni silver, 10 pct	56.56	59.83	62.89

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb cont'd Be	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.00
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	29.00 to 30.00
Copper, Lake, delivered	30.125
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	27.00
Magnesium, sticks, 100 to 500 lb.	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$191 to $194
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$93
Silver, New York, cents per oz.	85.25
Tin, New York	78.25
Titanium, sponge	$5.00
Zinc, East St. Louis	11.00
Zinc, New York	11.25-11.83
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	24.50
No. 120	23.75
No. 123	23.25
80-10-10 ingot	
No. 305	28.75
No. 315	26.50
88-10-2 ingot	
No. 210	37.50
No. 215	34.00
No. 245	29.50
Yellow ingot	
No. 405	20.75
Manganese bronze	
No. 421	25.25

Aluminum Ingot

(Cents per lb del'd, 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	24.50-25.00
0.60 copper, max.	24.00-24.75
Piston alloys (No. 122 type)	22.50-23.00
No. 12 alum. (No. 2 grade)	21.75-22.50
108 alloy	22.50-23.00
195 alloy	22.50-24.00
13 alloy (0.60 copper max.)	24.00-24.75
ASX-679	22.50-22.75

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	23.75-24.00
Grade 2—92-95%	22.50-23.00
Grade 3—90-92%	21.50-22.00
Grade 4—85-90%	20.50-21.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	45.14
Electrodeposited	37.98
Flat rolled	45.64
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	79.50
Roller, depolarized	80.50
Cadmium	$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	28⅝	27⅝
Yellow brass	21⅞	19⅝
Red brass	25½	24⅝
Comm. bronze	26½	25⅝
Mang. bronze	20	19¼
Brass rod ends	19¾	

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	23½—24
No. 2 copper wire	22
Light copper	21
*Refinery brass	19½—20

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	24
No. 2 copper wire	22½
Light copper	21
No. 1 composition	18½—18⅝
No. 1 comp. turnings	18 —18⅛
Rolled brass	14 —14⅛
Brass pipe	14 —14⅛
Radiators	14

Aluminum

Mixed old cast	14 —14⅛
Mixed new clips	14½—16
Mixed turnings, dry	14 —14⅛
Pots and pans	14 —14⅛

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	23
No. 2 heavy copper and wire	20
Light copper	18
New type shell cuttings	18
Auto radiators (unsweated)	13
No. 1 composition	16½—17
No. 1 composition turnings	16 —16½
Unlined red car boxes	15 —16
Cocks and faucets	16
Mixed heavy yellow brass	11½
Old rolled brass	14
Brass pipe	16
New soft brass clippings	16½—17½
Brass rod ends	16 —16½
No. 1 brass rod turnings	15 —16

Aluminum

Alum. pistons and struts	7 — 7½
Aluminum crankcases	10
2S aluminum clippings	14
Old sheet and utensils	10
Borings and turnings	7½
Misc. cast aluminum	10
Dural clips (24S)	10

Zinc

New zinc clippings	5½
Old zinc	4½
Zinc routings	2½
Old die cast scrap	3½

Nickel and Monel

Pure nickel clippings	100
Clean nickel turnings	85
Nickel anodes	100
Nickel rod ends	100
New Monel clippings	33 —35
Clean Monel turnings	25
Old sheet Monel	30 —32
Nickel silver clippings, mixed	14
Nickel silver turnings, mixed	12

Lead

Soft scrap, lead	11 —11½
Battery plates (dry)	6¼— 6½
Batteries, acid free	4.60— 4.70

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	60 —65
No. 1 pewter	37 —40
No. 1 auto babbitt	40
Mixed common babbitt	12 —13½
Solder joints	15 —15½
	40
Siphon tops	15½
Small foundry type	14½
Monotype	13½
Lino. and stereotype	11½
Electrotype	9
Hand picked type shells	5½
Lino. and stereo. dross	5
Electro dross	

"...More than 6,000 of our employees are now participating..."

MELVIN H. BAKER
Chairman of the Board, National Gypsum Company

"The Payroll Savings Plan for Bonds provides a convenient and profitable way for America's wage earners to save. Millions of Payroll Savers have become proud owners of homes purchased with Bonds bought this way. It also helps our national government with its problems of managing the public debt. We in National Gypsum urge the stimulation of the Payroll Savings Plan and are proud to report that more than 6,000 of our employees are now participating."

Here's another success story of a person-to-person canvass:

In the Wahoo (Nebraska) ordnance plant of the National Gypsum Company, employee participation in the Payroll Savings Plan was a very low 1.73%.

In September of last year, with the whole-hearted encouragement of top management, the 3,000 employees of Gypsum's Ordnance Plant organized to conduct a person-to-person canvass to put a Payroll Savings Application Blank in the hands of every employee.

90% of the employees signed up in the opening days of the campaign. By September 12th, employee participation was 93.7%. On October 2nd, participation was almost 97%—and still going up.

To quote from National Gypsum's printed report of the Payroll Savings campaign:

• "Did we use fancy charts! Did we use advertisements? Did we have long-winded meetings. Did we give prizes for production? The answer is No! We put the proposition squarely to the people, and we reported to the people once a week in bulletin form to let them know where they stood in relation to other departments as well as to the plant total. Once the spirit of competition and teamwork caught fire, once it became a matter of personal pride: a successful conclusion was only a matter of time and effort."

Justifiably proud of its sponsorship of the Payroll Savings Plan and the 97% enrollment of its employees, National Gypsum Company prepared a very interesting folder, "Bombs and Bonds for National Defense. The Savings Bond Program of the National Gypsum Company." Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D.C., will be glad to send you a copy. Read how easy it is to build *your* Payroll Plan to 90% or more participation.

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UNIVERSITY OF MICHIGAN LIBRARIES

Cloudy for Some, Sunny for Others

A few centers stay optimistic, others feel they're marking time till fall can hypo buying . . . Tone of market for Pittsburgh, Cincinnati soft . . . Chicago stays bullish.

While a few scrap centers held firmly to their market optimism, and had buying evidence to bolster it, other areas felt they were merely marking time until the fall could bring more substantial buying.

In Pittsburgh the general market tone was soft. Secondary steelmaking grades rose $1 but the next purchase was not expected to hold the ground gained. Because Cincinnati mills cut August buying, most openhearth grades sank $1. No. 1 grades continued popular in Detroit but secondary grades were difficult to move.

St. Louis reported that a few small fill-in orders comprised its scrap movement. The Boston market was listless. In New York the market was holding but brokers were not enthusiastic.

For some there was a sunnier side of the street. Chicago scrap remained bullish while in Cleveland the market remained relatively strong at last month's prices. Buffalo was holding its own while Birmingham traders foresaw that supply would balance out with orders in August.

Pittsburgh—Despite a purchase of secondary openhearth grades at $1 above prevailing prices, general tone of the market is soft. No. 1 heavy melting steel is off $1 per ton to a top of $46 on basis of a firm offer to sell. Next purchase of secondary grades is expected to be made at prevailing prices or lower. Railroad grades show signs of weakening, with specialties off $1 per ton to $52.50 top.

Chicago—Scrapmen here continued to believe the market was firm and strong last week. Proof was in the upward march of railroad scrap prices. While a few thought turnings may have reached their top, most felt all grades were stable, and the end of the vacation period and the beginning of fall weather would keep prices at current levels. No. 1 RR heavy melting moved up again, and nearly all railroad grades were up in prices paid the railroads.

Philadelphia—Reports that one area mill will remain out of the market for the rest of the month, another curbing shipments for a short time, made the market a shade more pessimistic. More rigid inspection on No. 2 bundles was reported. Buying by some consumers has improved their inventory position.

New York—The market was holding steady. Some traders thought strengthening must wait until fall. Prices remained relatively unchanged. Unstripped motor blocks which had rallied seemed to be on the wane again. Mixed borings and turnings were reportedly stronger. The truce had no effect here. The market remained fairly slow and steady.

Detroit — Continued insistence of buyers on No. 1 grades has kept their prices up while at the same time depressing prices of secondary items. Result is an abnormal spread and difficulty in pushing No. 2 steel and bundles. Blast furnace grades are at a standstill and cast is a trifle easier. General market trend was down except for top quality grades.

Cleveland—Market here stayed relatively strong at last month's prices. Although Korean truce has momentarily taken the "up" out of the market, steel production and scarcity of scrap may force a revival when mills start thinking of winter tonnages. Blast furnace grades are strong at $29 with some turnings reported moving out of area. At least two buyers showed ample confidence in the market last week as they paid premium prices for No. 1 factory bundles.

Birmingham—Although some scrap orders from Pittsburgh area mills appeared weakening, requests from other areas for August are sufficient to take care of supplies anticipated by dealers for the month. Suppliers, evidently convinced of little likelihood of increased prices, are beginning to bring a little more scrap into the yards. Largest buyer of blast furnace and openhearth scrap in the district did not come back into the market Aug. 1 as expected, but an Atlanta mill indicated it would be buying next week.

St. Louis—A few small fill-in orders comprised scrap movement here. Receipts have been light, heat halting collection and processing of supplies. Mills in the district are operating at full capacity. One of the larger mills is expected to come into the market during this month.

Cincinnati—Mills cut back sharply on their buying for August and price on No. 1 heavy melting, No. 1 bundles and No. 2 dropped $1. No. 2 heavy melting remained unchanged because this item was in a more competitive position. Blast furnace grades dropped from $2 to $3 in a very nominal market. Mills just aren't buying turnings in this area and dealers are scrambling for sales. Brokers report having very little difficulty buying all the steelmaking scrap they want at reduced prices.

Boston — This week's activity has been confined to adjustments in an otherwise listless market. No. 2 heavy melting and No. 2 bundles have dropped $1 in a realignment of values. Demand for really good material is still strong. A little activity in cast following months of a dull market brings No. 1 machinery and mixed cupola up $1.

Buffalo—Market was holding its own at the start of the week. Mills delayed placing new orders as dealers still had large tonnage on books from July. Dealers reported yard receipts light, reflecting vacations. Cast market again was on the sloppy side but no new sales took place below prevailing ranges.

West Coast—Market for cast has become weaker due to heavy foundry inventory and low priced foreign pig iron. Western domestic pig also being offered at low rates. Steel scrap market continues slow with no price changes.

THE ROLE OF SCRAP in the FLIGHT of PLANES

"HUMAN CENTRIFUGE"

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The arm that carries this tremendous force is made of 41/30 aircraft chrome molybdenum steel tubing. Approximately 50% steel scrap is used in its manufacture. These special steels require special scrap of known analysis — a problem particularly suited to our experience, personnel, equipment and the strategic location of our field offices.

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SEATTLE, WASH.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

UNIVERSITY OF MICHIGAN LIBRARIES

Scrap Prices

(Effective August 4, 1953)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and ms. turns.	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. punch'gs, plate	48.00 to 49.00
Heavy turnings	42.00 to 43.00
No. 1 RR. hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	49.00 to 50.00
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	51.50 to 52.50
RR. spring steel	51.50 to 52.50
RR. couplers and knuckles	51.50 to 52.50
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00
Malleable	50.00 to 51.00

Chicago

No. 1 hvy. melting	$43.00 to $45.00
No. 2 hvy. melting	39.00 to 40.50
No. 1 factory bundles	44.00 to 46.00
No. 1 dealers' bundles	43.00 to 45.00
No. 2 dealers' bundles	35.00 to 37.00
Machine shop turn.	23.00 to 25.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. forge crops	50.00 to 51.00
Low phos. punch'gs, plate	46.00 to 48.00
Low phos. 3 ft and under	45.00 to 47.00
No. 1 RR. hvy. melting	46.00 to 48.00
Scrap rails, random lgth.	50.00 to 51.00
Rerolling rails	57.00 to 58.00
Rails 2 ft and under	55.00 to 57.00
Locomotive tires, cut	49.00 to 51.00
Cut bolsters & side frames	48.00 to 50.00
Angles and splice bars	50.00 to 51.00
RR. steel car axles	55.00 to 57.00
RR. couplers and knuckles	50.00 to 52.00
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	42.00 to 44.00
Heavy breakable cast.	40.00 to 41.00
Cast iron brake shoes	38.00 to 40.00
Cast iron car wheels	45.00 to 47.00
Malleable	46.00 to 48.00
Stove plate	37.00 to 39.00

Philadelphia Area

No. 1 hvy. melting	$44.00 to $44.50
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	35.50 to 36.50
Machine shop turn.	27.00 to 28.00
Mixed bor., short turn.	30.00 to 31.00
Shoveling turnings	32.00 to 34.00
Clean cast chem. borings	37.50 to 38.00
Low phos. 5 ft and under	44.00 to 45.00
Low phos. 2 ft and under	46.00 to 47.00
Low phos. punchings	46.00 to 47.00
Elec. furnace bundles	45.00 to 46.00
Heavy turnings	42.00 to 43.00
RR. steel wheels	50.00 to 51.00
RR. spring steel	49.00 to 50.00
Rails 18 in. and under	55.00 to 56.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	41.00 to 43.00
Cast iron carwheels	46.00 to 47.00
Malleable	46.00 to 47.00
Unstripped motor blocks	31.00 to 32.00
No. 1 machinery cast.	46.00 to 47.00
Charging box cast.	39.00 to 40.00

Cleveland

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	28.00 to 29.00
Low phos. 2 ft and under	47.00 to 48.00
Drop forge flashings	45.00 to 46.00
No. 1 RR. hvy. melting	47.00 to 48.00
Rails 3 ft and under	54.00 to 55.00
Rails 18 in. and under	56.00 to 57.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	38.00 to 39.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	44.00 to 45.00
Malleable	50.00 to 51.00

Youngstown

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	40.00 to 41.00
Machine shop turn.	29.00 to 30.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. plate	48.00 to 49.00

Buffalo

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	40.00 to 40.50
No. 1 busheling	43.00 to 44.00
No. 1 bundles	43.00 to 44.00
No. 2 bundles	38.00 to 38.50
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	31.00 to 31.50
Shoveling turnings	32.00 to 32.50
Cast iron borings	31.00 to 31.50
Low phos. plate	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	53.00 to 54.00
RR. steel wheels	53.00 to 53.50
RR. spring steel	53.00 to 53.50
RR. couplers and knuckles	53.00 to 53.50
No. 1 machinery cast.	44.00 to 45.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 bundles, openhearth	40.00 to 41.00
No. 2 bundles	31.00 to 32.00
New busheling	35.00 to 36.00
Drop forge flashings	35.00 to 36.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Electric furnace, bundles	40.00 to 41.00
Low phos. punch'gs, plate	38.00 to 39.00
No. 1 cupola cast	43.00
Heavy breakable cast.	33.00
Stove plate	35.00
Automotive cast.	43.00

St. Louis

No. 1 hvy. melting	$42.00 to $44.00
No. 2 hvy. melting	36.50 to 37.50
No. 2 bundled sheets	33.00 to 34.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	23.50 to 24.50
Cast iron borings	17.00 to 18.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails, random lengths	48.00 to 50.00
Rails 18 in. and under	53.00 to 55.00
Locomotive tires, uncut	44.00 to 46.00
Angles and splice bars	47.00 to 48.00
Std. steel car axles	55.00 to 56.00
RR. spring steel	49.00 to 50.00
Cupola cast.	41.00 to 42.00
Hvy. breakable cast.	37.00 to 38.00
Cast iron brake shoes	40.00 to 41.00
Stove plate	34.00 to 35.00
Cast iron car wheels	43.00 to 44.00
Malleable	46.00 to 47.00
Unstripped motor blocks	37.00 to 38.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $37.50
No. 2 hvy. melting	31.00 to 31.50
No. 2 bundles	29.00 to 29.50
Low phos. 2 ft and less	39.50 to 40.50
Machine shop turn.	20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	24.50 to 25.00
Clean cast chem. borings	28.00 to 29.00
No. 1 machinery cast.	41.00 to 42.00
Mixed yard cast.	33.00 to 34.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstripped motor blocks	24.00 to 25.00

Birmingham

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	33.00 to 34.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	29.50 to 30.50
Machine shop turn.	23.00 to 23.50
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Electric furnace bundles	32.00 to 33.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft	36.00 to 37.00
No. 1 RR. hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	46.00 to 47.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	45.00 to 46.00
Std. steel axles	45.00 to 46.00
No. 1 cupola cast.	43.00 to 44.00
Stove plate	40.00 to 41.00
Cast iron car wheels	46.00 to 47.00
Charging box cast.	30.00 to 31.00
Heavy breakable	30.00 to 31.00
Unstripped motor blocks	32.00 to 33.00
Mashed tin cans	17.00 to 18.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	32.50 to 33.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	32.50 to 33.00
Elec. furnace, 3 ft & under	34.00 to 35.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and short turn.	21.00
Shoveling turnings	21.50 to 22.00
Clean cast chem. borings	27.17
No. 1 machinery cast	31.00 to 32.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Stove plate	27.00 to 28.00
Unstripped motor blocks	22.00

Cincinnati

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Low phos. 18 in. & under	47.00 to 48.00
Rails, random lengths	46.00 to 47.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	42.00 to 43.00
Hvy. breakable cast.	37.00 to 38.00
Drop broken cast.	48.00 to 49.00

San Francisco

No. 1 hvy. melting	$28.00
No. 2 hvy. melting	24.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	18.00
Machine shop turn.	10.00
Cast iron borings	15.00
No. 1 RR. hvy. melting	28.00
No. 1 cupola cast.	$38.00 to 39.00

Los Angeles

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	30.00
No. 1 bundles	33.00
No. 2 bundles	30.00
No. 3 bundles	16.00
Mach. shop turn.	8.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. fur. 1 ft and under	29.00
No. 1 RR. hvy. melting	24.00
No. 1 cupola cast.	$36.00 to 38.00

Seattle

No. 1 hvy. melting	$31.00
No. 2 hvy. melting	27.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 1 cupola cast.	37.00
Mixed yard cast.	35.00

Hamilton Ont.

No. 1 hvy. melting	$32.00
No. 1 bundles	33.50
No. 2 bundles	32.00
Mechanical bundles	30.50
Mixed steel scrap	28.50
Bushelings	27.50
Bush., new fact. prep'd	30.50
Bush., new fact. unprep'd	29.50
Short steel turnings	22.50
Mixed bor. and turn.	26.50
Rails, remelting	32.50
Rails, rerolling	41.50
Cast scrap	48.00

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UNIVERSITY OF MICHIGAN LIBRARIES

Comparison of Prices

(Effective August 4, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Aug. 4 1953	July 28 1953	July 7 1953	Aug. 5 1952
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.275	5.075
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.575	5.575	5.575	5.20
Plate	4.10	4.10	4.10	3.90
Plates wrought iron	9.00	9.00	9.00	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	36.75•
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$8.95	$8.95	$8.95	$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. ternes	7.75	7.75	7.75	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.15¢	4.15¢	4.15¢	3.95¢
Cold finished bars	5.20	5.20	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	35.50	35.50	35.50	31.50•
Wrought iron bars	10.05	10.05	10.05	10.05
Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢
Rails: (per 100 lb.)				
Heavy rails	$4.325	$4.325	$4.325	$3.775
Light rails	5.20	5.20	5.20	4.25
Semifinished Steel: (per net ton)				
Rerolling billets	$62.00	$62.00	$62.00	$59.00
Slabs, rerolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slabs	82.00	82.00	82.00	76.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55
Finished Steel Composite: (per pound)				
Base price	4.634¢	4.634¢	4.634¢	4.376¢

• Add 4.7 pct.

	Aug. 4 1953	July 28 1953	July 7 1953	Aug. 5 1952
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$62.19	$62.19	$62.19	$60.69
Foundry, Valley	56.50	56.50	56.50	55.00
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.93
Foundry, Birmingham	52.88	52.88	52.88	51.38
Foundry, Chicago†	56.50	56.50	61.27	55.00
Basic del'd, Philadelphia	61.27	61.27	56.00	59.77
Basic, Valley furnace	56.00	56.00	56.50	54.50
Malleable, Chicago†	56.50	56.50	56.50	55.00
Malleable, Valley	56.50	56.50	56.50	55.00
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	10.00¢	8.06¢
Pig Iron Composite: (per gross ton)				
Pig iron	$56.76	$56.76	$56.01	$55.28
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$45.50*	$46.50	$45.50	$43.00•
No. 1 steel, Phila. area	44.25	44.25	43.50	40.75
No. 1 steel, Chicago	44.00	44.00	41.50	41.50
No. 1 bundles, Detroit	40.50	40.50	37.50	41.25•
Low phos., Youngstown	48.50	48.50	47.50	46.50•
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	52.00
No. 1 mach'y cast, Philadel'a	46.50	46.50	45.50	48.50
No. 1 mach'y cast, Chicago	46.50	46.50	44.50	44.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	*$44.58*	$44.92	$43.83	$42.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	*29.50‡*	29.875‡	29.875‡	24.50
Copper, Lake, Conn.	30.125	30.125	30.125	24.625
Tin, Straits, New York	78.25†	78.25•	90.50	$1.21½
Zinc, East St. Louis	11.00	11.00	11.00	15.00
Lead, St. Louis	13.55	13.55	13.30	15.80
Aluminum, virgin ingot	21.50	21.50•	20.50	19.00
Nickel, electrolytic	63.08	63.08	63.08	59.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	39.00

† Tentative. ‡ Average. • Revised

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 pct Mn basis

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *S5*	52.38	52.88	.....	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	.....	.....
Everett *M6*	.....	63.25	63.75	57.00	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	56.50	57.00	61.00
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	56.00	56.50	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	60.00	60.50	61.00	61.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	56.00	56.50	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1*, *G1*, $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct or more phosphorus. Manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEELS

Base price cents per lb., f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50–46.75	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25–37.50	37.50	39.75	39.75	59.00	45.75–46.00	51.25	30.00	30.50–31.00	30.50
Sheets	46.25	46.50	48.75	48.75	64.50	55.50	60.75	40.75	41.25	43.50
Strip, hot-rolled	29.75	32.00	36.75	34.25	55.00	42.00	47.50	26.25	.....	27.00
Strip, cold-rolled	38.25–38.50	41.50	45.50	43.75	66.50	54.50	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2*; (type 316 add 4.5¢) *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Lockport, N. Y., *R4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa. *W2*; (type 316 add 4.5¢); W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*, Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Lockport, N. Y., *S4*; Sharon, Pa., *S1* (type 301 add ¼¢); Butler, Pa., *A7*; Wallingford, Conn., *W1*.

Bars: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Lockport, N. Y., *S4*; Canton, O., *T5*; Ft. Wayne, *J4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*, Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Lockport, N. Y., *S4*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

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NN-B-631c	*Wirebound Domestic*
NN-B-601b	*Cleated Plywood - Domestic*
JAN-P-105A	*Cleated Plywood - Export*
LLL-B-631c	*Fibre Corrugated - Domestic*
NN-B-591a	*Fiberboard, Wood, Cleated*
MIL-B-2427	*Wood Ammunition Boxes*
JAN-P-132	*Wood Crates - Unsheathed*
MIL-C-11133	*Wirebound Crates - Domestic (QMC)*

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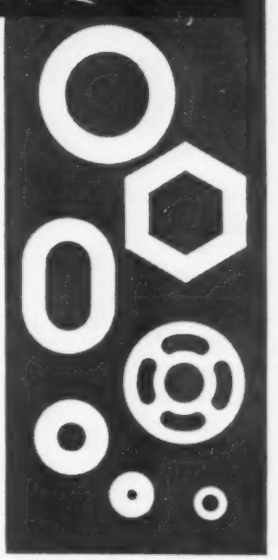

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IRON AGE

STEEL PRICES

(Effective Aug. 4, 1958)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PILING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Bethlehem, Pa.					$82.00 *B3*			4.15 *B3*	6.20 *B3*				
	Buffalo, N. Y.			$62.00 *B3*	$75.50 *B3, R3*	$82.00 *B3, R3*		4.925 *B3*	4.15 *B3*	6.20 *B3*	3.925 *B3, R3*	5.45 *B3*	6.00 *B3*	8.425 *B3*
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.										4.325 *A2*		6.20 *A2*	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			$62.00 *B3*	$75.50 *B3*	$82.00 *B3*			4.15 *B3*	6.20 *B3*				
	Newark, N. J.													
	New Haven, Conn.											5.95 *A5* 6.20 *D1*		
	Phoenixville, Pa.													
	Putnam, Conn.													
	Sparrows Pt., Md.										3.925 *B3*	5.45 *B3*	6.00 *B3*	8.425 *B3*
	Worcester, Mass.													
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.													
	Ashland, Ky.										3.925 *A7*			
	Canton-Massillon, Ohio				$75.50 *R3*	$82.00 *R3*								
	Chicago, Ill.			$62.00 *U1*	$75.50 *R3, U1, W8*	$82.00 *U1, W8, R3*		4.925 *U1*	4.10 *U1, W8*	6.175 *U1*	3.925 *A1, W8*	5.95 *A1*	5.95 *R3*	
	Sterling, Ill.													
	Cleveland, Ohio				$75.50 *R3*							5.45 *A5, J3*		7.80 *J3*
	Detroit, Mich.		$63.00 *R5*		$78.50 *R5*	$85.00 *R5*					4.225 *G3* 4.40 *M2*	5.65 *G3, M2* 5.95 *D1* 6.05 *D2*	6.50 *G3*	7.90 *D2* 8.50 *G3*
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana			$62.00 *U1*	$75.50 *U1*	$82.00 *U1, Y1*		4.925 *I3*	4.10 *I3, U1*	6.175 *U1, I3*	3.925 *I3, U1, Y1*	5.70 *I3*	5.95 *U1, I3* 6.45 *Y1*	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.45 *A7*		
	Niles, Ohio Sharon, Pa.										4.225 *S1*	5.80 *S1*	5.95 *S1*	7.65 *S1*
	Pittsburgh, Pa. Midland, Pa.	$59.00 *U1*	$62.00 *U1*	$62.00 *U1* $62.50 *J3*	$75.50 *J3, U1*	$82.00 *U1*	3.75 *U1* 3.85 *J3*	4.925 *U1*	4.10 *J3, U1*	6.175 *J3, U1*	4.425 *S7, S9*	5.45 *B4, J3* 6.15 *S7*		7.80 *J3*
	Portsmouth Ohio													
	Weirton, Wheeling Follansbee, W. Va.								4.35 *W3*		4.025 *W3*	5.45 *F3, W3*	6.30 *W3*	
	Youngstown, Ohio					$82.00 *Y1*	3.75 *R3, U1*		4.10 *Y1*		3.925 *R3, U1, Y1*	5.45 *R3, Y1*	5.95 *U1, R3* 6.45 *Y1*	7.60 *R3* 8.30 *Y1*
WEST	Fontana, Cal.	$86.00 *K1*	$88.00 *K1*	$81.00 *K1*	$94.50 *K1*	$101.00 *K1*			4.75 *K1*	6.825 *K1*	4.70 *K1*	7.35 *K1*	7.05 *K1*	
	Geneva, Utah				$75.50 *C7*				4.10 *C7*	6.175 *C7*				
	Kansas City, Mo.								4.80 *S2*	6.875 *S2*	4.625 *S2*		6.65 *S2*	
	Los Angeles, Torrance, Cal.				$94.50 *B2*	$102.00 *B2*			4.80 *B2, C7*	6.85 *B2*	4.675 *B2, C7*			
	Minnequa, Colo.													
	San Francisco, Niles, Pittsburg, Cal.				$94.50 *B2*				4.75 *B2* 4.91 *P9*	6.80 *B2*	4.675 *B2, C7*			
	Seattle, Wash.				$94.50 *B2, S11*				4.85 *B2*	6.90 *B2*				
SOUTH	Atlanta, Ga.										4.475 *A8*			
	Fairfield, Ala. Alabama City, Ala.			$62.00 *T2*	$75.50 *T2*				4.10 *R3, T2*	6.175 *T2*	3.925 *R3, T2*		5.95 *T2*	
	Houston, Texas				$85.50 *S2*	$92.00 *S2*			4.60 *S2*		4.425 *S2*			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

(Effective Aug. 4, 1953)

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	
Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
													Bethlehem, Pa.
3.925 *B3*	4.775 *B3*				5.90 *B3*	7.225 *B3*			4.525 *W6*				Buffalo, N. Y.
										† Special coated mfg terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50-lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢.			Claymont, Del.
													Coatesville, Pa.
4.225 *A2*					6.15 *A2*								Conshohocken, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
									4.525 *B3*				Johnstown, Pa.
													Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
4.425 *U1*	4.875 *U1*									$8.80 *U1*	$7.50 *U1*	6.60 *U1*	Morrisville, Pa.
3.925 *B3*	4.775 *B3*	5.275 *B3*			5.90 *B3*	7.225 *B3*	8.075 *B3*		4.625 *B3*	$8.80 *B3*	$7.50 *B3*		Sparrows Pt., Md.
									4.825 *A5*				Worcester, Mass.
													Trenton, N. J.
													Alton, Ill.
3.925 *A7*		5.275 *A7*	5.175 *A7*										Ashland, Ky.
		5.275 *R3*											Canton-Massillon, Ohio
3.925 *A1, W8*					5.90 *U1*				4.525 *A5, N4, R3*				Chicago, Ill.
									4.625 *N4*				Sterling, Ill.
3.925 *J3, R3*	4.775 *J3, R3*		5.175 *R3*		5.90 *J3, R3*	7.225 *J3, R3*			4.525 *A5*				Cleveland, Ohio
4.125 *G3*	4.975 *G3*				6.375 *G3*	7.675 *G3*							Detroit, Mich.
													Duluth, Minn.
3.925 *I3, U1, Y1*	4.775 *I3, U1, Y1*	5.275 *U1* 5.325 *I3*	5.175 *I3, U1*	5.675 *U1*	5.90 *U1, I3* 6.40 *Y1*	7.225 *U1* 7.725 *Y1*				$8.70 *I3, U1, Y1*	$7.40 *I3, U1*	6.10 *U1, Y1*	Gary, Ind. Harbor, Indiana
		5.475 *G2*	5.875 *G2*								$7.60 *G2*	6.30 *G2*	Granite City, Ill.
		5.375 *C9*											Kokomo, Ind.
	4.775 *A7*		5.175 *A7*	5.675 *A7*									Middletown, Ohio
4.225 *S1*				5.45 *S1*	5.90 *S1*						$7.40 *R3*		Niles Ohio Sharon, Pa.
3.925 *J3, U1, P6*	4.775 *J3, U1*	5.275 *U1*	5.175 *U1*		5.90 *J3, U1*	7.225 *J3, U1*	7.925 *U1*		4.525 *A5* 4.725 *P6*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1*	Pittsburgh Pa. Midland, Pa.
									4.725 *D1*				Portsmouth, Ohio
3.925 *W3, W5*	4.775 *W3, W5*	5.275 *W3, W5*		5.675 *W3, W5*		7.475 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.55 *W5*	Weirton, Wheeling, Follansbee, W. Va.
3.925 *R3, U1, Y1*	4.775 *R3, Y1*				5.90 *U1, R3* 6.40 *Y1*	7.225 *R3* 7.725 *Y1*			4.525 *Y1*	$8.70 *R3*			Youngstown, Ohio
4.70 *K1*	5.875 *K1*				7.00 *K1*	8.275 *K1*			5.325 *K1*				Fontana, Cal.
4.025 *C7*													Geneva, Utah
									4.865 *S2*				Kansas City, Mo.
4.025 *C7*		6.025 *C7*						5.325 *B2*					Los Angeles, Torrance, Cal.
													Minnequa, Colo.
4.025 *C7*	5.725 *C7*	6.025 *C7*							5.175 *C7*	$9.45 *C7*	$8.15 *C7*		San Francisco, Niles Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.925 *R3, T2*	4.775 *T2*	5.275 *R3, T2*			5.90 *T2*			5.125 *T2* 5.225 *R3*	4.525 *T2, R3*	$8.80 *T2*	$7.50 *T2*		Fairfield Ala. Alabama City, Ala.
4.025 *S2*									4.925 *S2*				Houston, Texas

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STEEL PRICES

(Effective Aug. 4, 1953)

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		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				4.875 *B3*	6.275 *B3*	6.225 *B3*					
	Buffalo, N. Y.	4.15 *B3,R3*	4.15 *B3, R3*	5.25 *B5*	4.875 *B3,R3*	6.325 *B3* 6.325 *B5*	6.225 *B3*	4.10 *B3*			6.25 *B3*	5.525 *W6*
	Claymont, Del.											
	Coatesville, Pa.							4.35 *L4*		5.75 *L4*		
	Conshohocken, Pa.							4.55 *A2*	5.15 *A2*		6.50 *A2*	
	Harrisburg, Pa.											
	Hartford, Conn.			5.75 *R3*		6.775 *R3*						
	Johnstown, Pa.	4.15 *B3*	4.15 *B3*		4.875 *B3*		6.225 *B3*	4.10 *B3*		5.55 *B3*	6.25 *B3*	5.525 *B3*
	Newark, N. J.			5.65 *W10*		6.65 *W10*						
	New Haven, Conn.											
	Camden, N. J.					6.50 *P10*						
	Putnam, Conn.			5.75 *W10*								
	Sparrows Pt., Md.		4.15 *B3*					4.10 *B3*		5.55 *B3*	6.25 *B3*	5.625 *B3*
	Palmer, Worcester, Mansfield, Mass.			5.75 *B5*		6.775 *B5*						5.825 *A5, W6*
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.											
	Ashland, Ky.							4.10 *A7*				
	Canton-Massillon, Ohio	4.15 *R3*		5.20 *R2,R3*	4.875 *R3*	6.325 *R2,R3*						
	Chicago, Ill.	4.15 *R3, U1, W8*	4.15 *R3* 4.90 *N4*	5.20 *A5,W10, W8,B5, L2*	4.875 *U1, W8,R3*	6.325 *A5,W8, W10, L2, R3, B5*		4.10 *U1,W8*	5.15 *U1*	5.55 *U1*	6.25 *U1*	5.525 *A5, R3,N4* 5.625 *W7*
	Cleveland, Ohio	4.15 *R3*	4.15 *R3*	5.20 *A5,C13*		6.325 *A5,C13*		4.10 *J3,R3*	5.15 *J3*		6.25 *J3*	5.525 *A5, R3,C13*
	Detroit, Mich.	4.30 *R5* 4.50 *G3*		5.35 *R5,P8* 5.40 *B5* 5.45 *P3*	5.025 *R5* 5.225 *G3*	6.475 *R5,P8* 6.525 *B5,P3*	6.875 *G3*	4.65 *G3*			7.10 *G3*	
	Duluth, Minn.											5.525 *A5*
	Gary Ind. Harbor Crawfordsville, Indiana	4.15 *I3, U1, Y1*	4.15 *I3, U1, Y1*	5.20 *R3*	4.875 *I3, U1, Y1*	6.325 *R3,M5*	6.225 *U1,I3* 6.725 *Y1*	4.10 *I3, U1, Y1*	5.15 *I3*	5.55 *U1*	6.25 *U1,I3* 6.75 *Y1*	5.625 *M4*
	Granite City, Ill.											
	Kokomo, Ind.											5.625 *C9*
	Sterling, Ill.	4.75 *N4*	5.00 *N4*									5.625 *N4*
	Niles, Ohio Sharon, Pa.							4.10 *S1*		5.70 *S1*	6.25 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.15 *J3, U1*	4.15 *J3, U1*	5.20 *A5, J3, W10,R3*	4.875 *U1*	6.325 *A5, W10*	6.225 *J3, U1*	4.10 *J3, U1*	5.15 *U1*	5.55 *U1*	6.25 *J3, U1*	5.525 *A5, J3, P6*
	Portsmouth, Ohio											5.725 *D1*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W3*						4.40 *W3*				
	Youngstown, Ohio	4.15 *R3, U1, Y1*	4.15 *R3, U1, Y1*	5.20 *Y1*	4.875 *U1, Y1*		6.225 *U1* 6.725 *Y1*	4.10 *R3, U1, Y1*			6.75 *Y1*	5.525 *Y1*
WEST	Fontana, Cal.	4.85 *K1*	4.85 *K1*		5.925 *K1*		7.475 *K1*	4.75 *K1*		6.60 *K1*	6.95 *K1*	
	Geneva, Utah							4.10 *C7*			6.25 *C7*	
	Kansas City, Mo.	4.85 *S2*	4.85 *S2*		5.575 *S2*		6.925 *S2*					
	Los Angeles, Torrance, Cal.	4.85 *B2,C7*	4.85 *B2,C7*	6.65 *R3*	5.925 *B2*		6.925 *B2*					
	Minnequa, Colo.											
	San Francisco, Niles, Pittsburg, Cal.	4.85 *C7,P9* 4.90 *B2*	4.85 *C7,P9* 4.90 *B2*				6.975 *B2*					6.475 *C7*
	Seattle, Wash.	4.90 *B2*	4.90 *B2,S11*				6.975 *B2*	5.00 *B2*			7.15 *B2*	
SOUTH	Atlanta, Ga.	4.45 *A8*	4.45 *A8*									5.775 *A8*
	Fairfield, Ala. Alabama City, Ala.	4.15 *R3,T2*	4.15 *R3,T2*				6.225 *T2*	4.10 *R3,T2*			6.25 *T2*	5.525 *R3, T2*
	Houston, Texas Ft. Worth, Texas	4.65 *S2*	4.65 *S2*		5.375 *S2*			4.60 *S2*				

Steel Prices

(Effective Aug. 4, 1953)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Blin & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.

O1 Oliver Iron & Steel Co., Pittsburgh

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Co., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. *B3*	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0								
Youngstown *R3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Fontana *K1*	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0								
Pittsburgh *J3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Alton, Ill. *L1*																						
Sharon *M3*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Pittsburgh *N1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Wheeling *W5*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Wheatland *W4*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0								
Youngstown *Y1*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
Indiana Harbor *Y1*	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0								
Lorain *N2*	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34 75	19.5	35.25	20.0	36.75	20.0	15.75	0.0	19.75	2.5	22.25	5.0	23.75	6.5
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0								
Youngstown *R3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Fontana *K1*	16.75		20.75		22.75		23.25		23.75		24.25		24.75									
Pittsburgh *J3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Alton, Ill. *L1*																						
Sharon *M3*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Pittsburgh *N1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Wheeling *W5*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Wheatland *W4*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0								
Youngstown *Y1*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75
Indiana Harbor *Y1*	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0								
Lorain *N2*	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	16.25	0.75	20.75	3.75	23.75	6.75	28.75	9.75

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only buttweld and seamless, 2¼ pts. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 4½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 11.0¢.

UNIVERSITY OF MICHIGAN LIBRARIES

Steel Prices

(Effective Aug. 4, 1953)

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. *L4*	*32.7	
Washington, Pa. *J2*	....	
Claymont, Del. *C4*	....	
New Castle, Ind. *I2*	....	
Nickel-carbon		
10 pct. Coatesville, Pa. *L4*	37.5	
Inconel-carbon		
10 pct. Coatesville, Pa. *L4*	46.10	
Monel-carbon		
10 pct. Coatesville, Pa. *L4*	38.90	
No. 302 Stainless copper stainless, Carnegie, Pa. *A4*		....
Aluminized steel sheets, hot dip, Butler, Pa., *A7*		....

* Includes annealing and pickling, sandblasting.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$110.30 to $113.80
6 to 24-in., del'd N.Y.	113.50 to 114.50
6 to 24-in. Birmington.	96.50 to 101.00
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	$128.00 to $130.00

Class "A" and gas pipe, $5 extra; 4-in pipe is $5 a ton above 6-in.

ELECTRICAL SHEETS

22 Ga. H-R cut length F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech Bottom *W5*	....	8.35	9.60	10.40	10.95	11.50	12.20
Brackenridge *A3*	....	8.35	9.60	10.40	10.95	.....	12.20
Granite City *G2*	.....	.....	.....	.....	.....	.....	.....
Ind. Harbor *I3*	7.85	8.35	9.60	.....	.....	.....	.....
Mansfield *E2*	.....	.....	.....	.....	.....	.....	.....
Newport, Ky. *N5*	7.85	8.35	9.60	10.40	10.95	.....	.....
Niles, O. *N3*	7.85	8.35	.....	.....	.....	.....	.....
Vandergrift *U1*	7.85	8.35	9.60	10.40	10.95	11.50	12.20
Warren, O. *R3*	7.85	8.35	9.60	.....	.....	.....	.....
Zanesville *A7*	7.85	8.35	9.60	10.40	10.95	11.50	12.20

TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.66
1.5	4	1.5	8	—	31.0¢
6	4	2	6	—	96.5¢

High-carbon chromium	63.5¢
Oil hardened manganese	35¢
Special carbon	32.5¢
Extra carbon	27¢
Regular carbon	23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Twisted Barbless Wire	Galv. Barbed Wire	Merch. Wire Ann'ld	Merch. Wire* Galv.
	Col	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	131	140	...	149	...	153	6.675	7.075
Aliquippa, Pa. *J3*	...	...	...	...	...	...	...	...
Atlanta *A8*	...	...	...	...	...	...	...	...
Bartonville *K2*	...	...	...	...	...	...	...	...
Buffalo *W6*	...	...	...	...	...	...	...	...
Chicago, Ill. *N4*	131	143	...	149	158	156	6.675	7.225
Cleveland *A6*	...	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	...	6.675	...
Crawfrdsvl. *M4*	133	145	...	151	...	153	6.775	7.325
Donora, Pa. *A5*	131	140	...	149	...	153	6.675	7.075
Duluth *A5*	131	140	145	149	...	153	6.675	7.075
Fairfield, Ala. *T2*	131	140	...	149	...	153	6.675	7.075
Galveston *D4*	139	...	...	...	...	...	...	...
Houston *S2*	...	...	...	...	...	...	...	...
Johnstn., Pa. *B3*	131	143	145	...	156	156	6.675	7.225
Joliet, Ill. *A5*	131	140	...	149	...	153	6.675	7.075
Kokomo, Ind. *C9*	133	142	...	151	...	155	6.775	7.175
Los Angeles *B2*	...	...	...	...	...	...	...	...
Kansas City *S2*	...	...	...	...	...	...	...	...
Minnequa *C6*	...	...	...	...	...	...	...	...
Monessen *P6*	131	...	...	...	...	...	6.675	7.225
Moline, Ill. *R3*	...	...	145	...	...	...	...	...
Pittsburg, Cal. *C7*	150	163	...	173	173	173	7.625	8.025
Portsmouth *P7*	...	...	...	...	...	...	...	...
Rankin, Pa. *A5*	131	140	...	...	...	153	6.675	7.075
So. Chicago *R3*	131	140	145	149	...	153	6.675	7.075
S. San Fran. *C6*	...	...	...	...	...	...	...	...
Sparrows Pt. *B3*	133	...	...	151	158	158	6.775	7.225
Struthers, O. *Y1*	...	...	...	...	...	...	...	...
Worcester *A5*	137	...	...	...	...	...	6.975	...
Williamsport, Pa. *S10*	...	...	...	...	...	...	...	...

Cut Nails, carloads, base $8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa., (*A2*).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Bridgeport, Conn. *S7**	6.15	8.00	8.60	10.55	12.85
Carnegie, Pa. *S9*	....	8.00	8.60	10.55	12.85
Cleveland *A5*	5.45	7.65	8.60	10.55	12.85
Detroit *D2*	6.05	8.25	8.85	....	....
New Castle, Pa. *B4*	5.80	8.00	8.60	....	....
New Haven, Conn. *D1*	....	....	....	....	....
Sharon, Pa. *S1*	5.80	8.00	8.60	10.55	12.85
Trenton *R4*	....	7.95	8.55	10.50	12.80
Weirton, W. Va. *W3*	5.80	8.00	8.60	10.55	12.85
Worcester, Mass. *A5*	5.75	7.95	8.90	10.85	13.15
Youngstown *C5*	....	....	....	....	....

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	30.08	36.28	26.51	31.98
	2½	12	40.51	48.86	35.70	43.07
	3	12	45.92	55.39	.....	49.73
	3½	11	53.60	64.65	48.13	58.06
	4	10	65.91	79.50	63.92	77.10
National Tube	2	13	.....	32.98	24.88	.....
	2½	12	36.82	44.41	33.50	.....
	3	12	42.52	51.28	38.69	.....
	3½	11	49.63	59.87	45.16	.....
	4	10	65.91	79.50	59.97	.....
Pittsburgh Steel	2	13	27.34	32.98	.....	.....
	2½	12	36.82	44.41	.....	.....
	3	12	42.52	51.28	.....	.....
	3½	11	49.63	59.87	.....	.....
	4	10	65.91	79.50	.....	.....

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As Rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	6.20	7.64	7.81[3]	7.00	.....	6.85	6.98	6.86	7.92	.....	.....	.....	.....
Birmingham	.15	6.10	7.00	8.00[4]	6.30	.....	6.35	6.35	6.15	8.75	.....	.....	.....	.....
Boston	.20	6.89	7.83	9.23	7.13	9.23-9.35[2]	7.13	7.06	6.87	8.10	12.40	12.25-12.28	.....	14.75-14.78
Buffalo	.20	6.18-6.20	7.15	9.00-9.01	6.65-6.79	.....	6.65-6.68	6.55-6.59	6.35-6.65	7.45	.....	12.17-15.35	14.45	14.55
Chicago	.20	6.18	7.12	8.05	6.42	.....	6.33-6.38	6.46	6.28	7.30	.....	11.75	.....	14.25
Cincinnati	.20	6.46	7.14	8.42	6.67	.....	6.80	6.88	6.53	7.61	.....	12.12	.....	14.52
Cleveland	.20	6.18	7.12	7.90	6.58	.....	6.50	6.79	6.34	7.40	.....	11.89	.....	14.39
Denver		7.95	8.85	10.10	8.20	9.55	7.95	7.95	8.05	9.05	.....	.....	.....	15.25-15.75
Detroit	.20	6.35-6.45	7.25-7.32	8.34	6.30-7.31	7.36-8.35	6.53-6.85	6.93	6.56-6.57	7.60-7.69	12.27	12.12	14.52	13.44-14.62
Houston	.20	7.15	7.85	.....	7.45	.....	7.20	7.35	7.45	9.85	.....	12.95	.....	.....
Kansas City	.20	6.85	7.79	8.72	7.09	.....	7.05	7.13	6.95	8.08	.....	.....	.....	.....
Los Angeles	.20	7.25	9.00	9.60	7.55	10.75-11.30	7.20	7.35	7.15-7.25	9.40-9.75	13.40-13.55	13.05	15.75	15.85-16.05
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	7.89	.....	.....	.....	.....
Milwaukee	.20	6.35	7.29	8.22	6.59	.....	6.50-6.55	6.63	6.45	7.57	.....	11.92	.....	14.42
New Orleans	.15	6.51-6.66	7.56	8.25	6.63-6.78	.....	6.73-6.88	6.81-6.96	6.60-6.75	8.42-8.57	.....	.....	.....	.....
New York	.30	6.78	7.75	9.02	7.16	9.05	6.99	6.90	7.06	7.90-8.18	11.99-12.29	10.39-12.14	14.04-14.54	12.64-14.64
Norfolk	.20	6.90	.....	.....	7.20	.....	7.15	7.20	7.20	8.50	.....	.....	.....	.....
Philadelphia	.25	6.53	7.55-8.25	8.35	7.02	.....	6.63	6.67	6.87	7.94	12.04	11.89	14.29	14.39
Pittsburgh	.20	5.95-6.18	6.82	8.30-8.60	6.20-6.55	.....	6.03-6.33	6.07-6.46	5.98-6.28	7.12-7.40	.....	11.45-11.75	.....	13.75-14.25
Portland	.10	8.00	9.80	9.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salt Lake City	.20	9.05	10.80	10.65	9.35	.....	8.70	8.85	9.20	11.25	.....	.....	.....	.....
San Francisco	.15	7.35	8.70	9.90-10.15	7.60	10.35	7.20	7.25	7.15	9.75-9.85	13.55	12.80-13.05	15.50	15.55-16.05
Seattle	.20	7.95	8.50	9.90	7.82	.....	7.39	7.30	7.38	9.93	.....	13.30	.....	15.90
St. Louis	.20	6.48	7.42	8.35	6.72	.....	6.73	6.86	6.58	7.70	12.20	12.05	14.45	14.30-14.55
St. Paul	.15	6.84	7.78	8.71	7.08	.....	6.99	7.12	6.94	8.06	.....	12.19	.....	.....

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb. (2)20,000 lb or over. (3)450 to 1499 lb. (4)500 to 9999 lb.

Miscellaneous Prices

(Effective Aug. 4, 1953)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *UI*	4.325	5.20	5.275	....	....	....	....
Chicago *R3*	....	....	....	7.05	....	....	....
Cleveland *R3*	....	....	....	....	....	....	....
Ensley *T2*	4.325	5.20	....	....	....	....	....
Fairfield *T2*	....	5.20	....	....	....	5.125	....
Gary *UI*	4.325	5.20	....	....	....	5.125	....
Ind. Harbor *I3*	4.325	....	5.275	7.05	....	5.125	....
Johnstown *B3*	....	5.20	....	....	....	....	....
Joliet *UI*	....	5.20	5.275	....	....	....	....
Kansas City *S2*	....	....	....	....	....	....	....
Lackawanna *B3*	4.325	5.20	5.275	....	....	5.125	....
Lebanon *B3*	....	....	....	7.05	10.50	....	11.00
Minnequa *C6*	....	....	....	....	....	....	....
Pittsburgh *R3*	....	....	....	....	....	....	....
Pittsburgh *O1*	....	....	....	....	....	....	....
Pittsburgh *P5*	....	....	....	....	....	....	....
Pittsburgh *J3*	....	....	....	7.05	....	....	....
Pitts, Cal. *C7*	....	....	....	....	....	5.275	....
Seattle *B2*	....	....	....	....	....	5.275	....
Steelton *B3*	4.325	....	5.275	....	....	5.125	....
Struthers *Y1*	....	....	....	....	....	....	....
Torrance *C7*	....	....	....	....	....	5.275	....
Youngstown *R3*	....	....	....	7.05	....	....	....

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953 to end of season.

	Gross Ton
Openhearth lump	$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	9.80

Prices based on upper Lake rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	$14.50 to $15.00
Foundry beehive (f.o.b. oven)	
Connellsville, Pa.	$16.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	28.75
St. Louis, f.o.b.	26.00
Birmingham, del'd	23.21
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant threaded electrodes with nipples, unboxed

Diam. In in.	Length in in.	Cents Per lb.
	GRAPHITE	
24	84	20.50
18, 20	72	20.00
12, 14	72	20.50
7 to 10	60	21.00
6	60	23.25
4	40	26.00
3	40	27.50
2½	30	28.00
2	24	43.50
	CARBON	
40	100, 110	8.95
35	110	8.95
30	110	8.95
24	72 to 84	9.10
20	90	8.95
17	72	9.10
14	72	9.50
10, 12	60	10.30
8	60	10.55

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq

Pct Off List

	Less Keg Reg.	K.	Less Keg Hvy.	K.
½ in. & smaller	+2	15	+2	18
9/16 in. & ⅝ in.	+7	11	+32*	+10*
¾ in. to 1½ in. inclusive	+8	10	+27**	+6**
1⅝ in. & larger.	+9	9	+27	+6

* 9/16 to ¾ in.
** ⅞ to 1½ in.

Nuts, Hot Pressed—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	2	18	+20	net
¾ in. to 1½ in. inclusive	+6	12	+25	+4
1⅝ in. & larger.	+8	10	+25	+4

Nuts, Cold Punched—Hexagon

½ in. & smaller	11	26	8	23
9/16 in. & ⅝ in.	9	24	+2	15
¾ in. to 1½ in. inclusive	+1	16	+9	3
1⅝ in. & larger	+16	3	+20	net

Nuts, Semi-Finished—Hexagon

½ in. & smaller	23	36	14	28
9/16 in. & ⅝ in.	18	32	4	20
¾ in. to 1½ in. inclusive	8	23	+8	10
1⅝ in. & larger.	+14	5	+20	net
	Light			
7/16 in. & smaller	33	43		
½ in. thru ⅝ in.	26	37		
¾ in. to 1½ in. inclusive	18	30		

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 44½—10
Packaged, plain finish ..... 25½—10
Bulk, plain finish** 59*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger $8.90
Pct Off List
7/16 in. and smaller 30

Cap and Set Screws
(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 40
⅝ in. thru 1 in. up to & including 6 in. 26
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 43
⅜ in. thru 1 in. up to & including 6 in. 33
Milled studs 17
Flat head cap screws, listed sizes ... 12
Fillister head cap, listed sizes 7
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 37

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
½ in. & smaller x 6 in. & shorter	4	20
9/16 in. & ⅝ in. x 6 in. & shorter	5	21
¾ in. & larger x 6 in. & shorter	3	19
All diam. longer than 6 in.	+4	13
Lag, all diam. x 6 in. & shorter	12	27
Lag, all diam. longer than 6 in.	8	23
Plow bolts	30	..

REFRACTORIES

Fire Clay Brick *Carloads, per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.25) ... $99.30
No. 1 Ohio 92.40
Sec. quality, Pa., Md., Ky., Mo., Ill. 92.40
No. 2 Ohio 83.15
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.60) 14.40

Silica Brick

Mt. Union, Pa., Ensley, Ala. $99.30
Childs, Pa. 103.95
Hays, Pa. 105.10
Chicago District 122.40
Western Utah 116.55
California 122.85
Super Duty, Hays, Pa., Athens, Tex., Chicago 116.65
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 17.30
Silica cement, net ton, bulk, Hays, Pa. 19.60
Silica cement, net ton, bulk, Emsley, Ala. 18.45
Silica cement, net ton, bulk, Chicago District 18.45
Silica cement, net ton, bulk, Utah and Calif. 25.95

Chrome Brick *Per net ton*

Standard chemically bonded Balt., Chester $86.00
Burned, Balt., Chester 80.00

Magnesite Brick

Standard Baltimore $109.00
Chemically bonded, Baltimore 97.50

Grain Magnesite *St. ⅜-in. grains*

Domestic, f.o.b. Baltimore in bulk fines removed $64.40
Domestic, f.o.b. Chewalah, Wash., in bulk 38.00
in sacks 43.70

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.75

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

72½% $44.00
70% or more 42.50
60% or less 38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.i.f. New York, ocean bags .... 11.25¢
Canadian sponge iron, del'd. in East ..... 12.0¢
Domestic sponge iron, 98+% Fe, carloads lots ..... 15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 60.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe .. 53.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe. 83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots ..... 30.00¢ to 33.25¢
Copper, electrolytic ..... 43.50¢
Copper, reduced ..... 43.50¢
Cadmium, 100-199 lb 95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd.. $3.50
Lead ..... 21.75¢
Manganese ..... 57.0¢
Molybdenum, 99% $2.75
Nickel, unannealed ..... 88.0¢
Nickel, annealed ..... 95.0¢
Nickel, spherical, unannealed 92.0¢
Silicon ..... 33.5¢
Solder powder .. 7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 33.9¢
Stainless steel, 316 ..... $1.10
Tin ..... 14.04¢ plus metal value
Tungsten, 99% (65 mesh) ... $5.35
Zinc, 10 ton lots ..... 23.0¢ to 30.5¢

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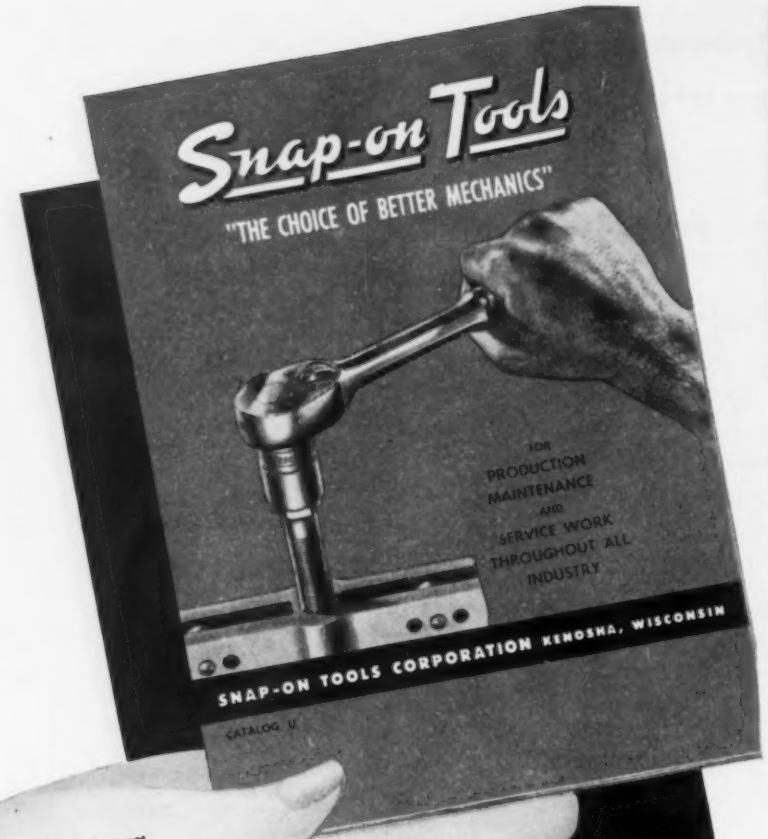
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—Ferroalloy Prices—

(Effective Aug. 4, 1958)

Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered. 65-72% Cr, 2% max. Si.

0.025% C	34.50	0.20% C	33.50
0.06% C	34.50	0.50% C	33.25
0.10% C	34.00	1.00% C	32.00
0.15% C	33.75	2.00% C	32.75
65-69% Cr, 4-9% C			24.75
62-66% Cr, 4-6% C, 6-9% Si			25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.14
9 to 11% C	1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.
Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump delivered.
30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50
Less ton lots	17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size:

Producing Point	Base Mn Content	Cents per lb (Contained Mn)
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	76-80%	13.15 (Per lb of alloy)
Clairton, Pa.	74-76%	10.00
Johnstown, Pa.	74-76%	10.00
Sheridan, Pa.	74-76%	10.00

Add or subtract 0.1¢ for each 1% Mn above or below base content.
Briquets—delivered, 66 pct. Mn.

Carload, bulk	13.50
Ton lots, packed	14.05

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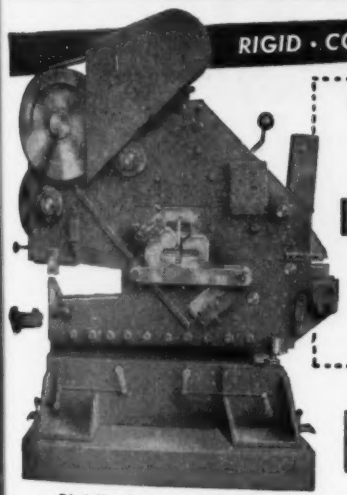

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ARMOR PLATE CONSTRUCTION
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- **Rigidly built of high tensile steel**
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- **Flywheel shaft mounted on ball bearings**

PARTIAL SPECIFICATIONS	T 15	T 25	T 30
Punch capacity	7/8" x 7/16"	1" x 9/16"	1-3/16" x 1/2" or 1-1/16" x 5/8"
Shears Plates	7/16"	1/2"	5/8"
Shears Flats	3-3/16" x 9/16"	3-3/16" x 5/8"	4" x 3/4"
Shears Angles (Square Cut)	3 1/8" x 5/16"	4" x 3/8"	5" x 1/2"
Shears Tees	3 1/8" x 5/16"	4" x 3/8"	4 3/4"
Shears Round	1-13/16"	1 3/8"	1 3/4"
Shears Square	1"	1 1/4"	1 1/2"

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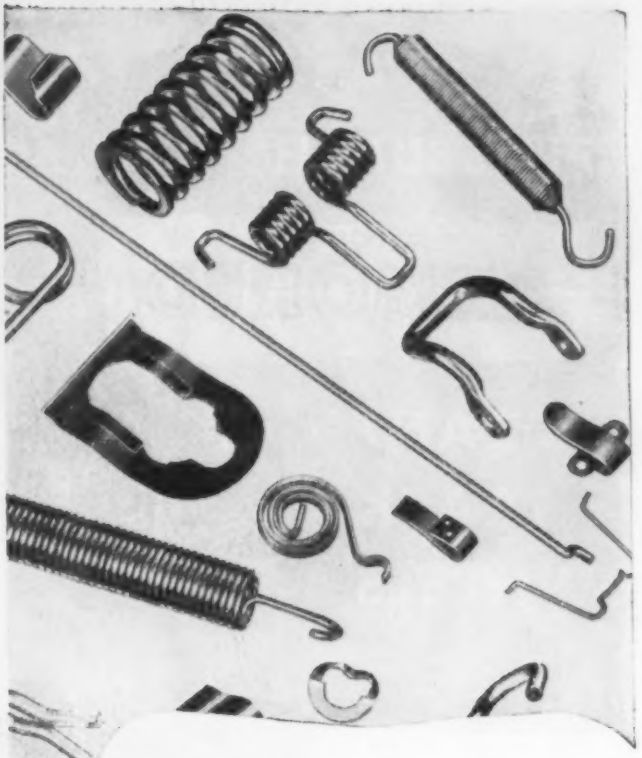

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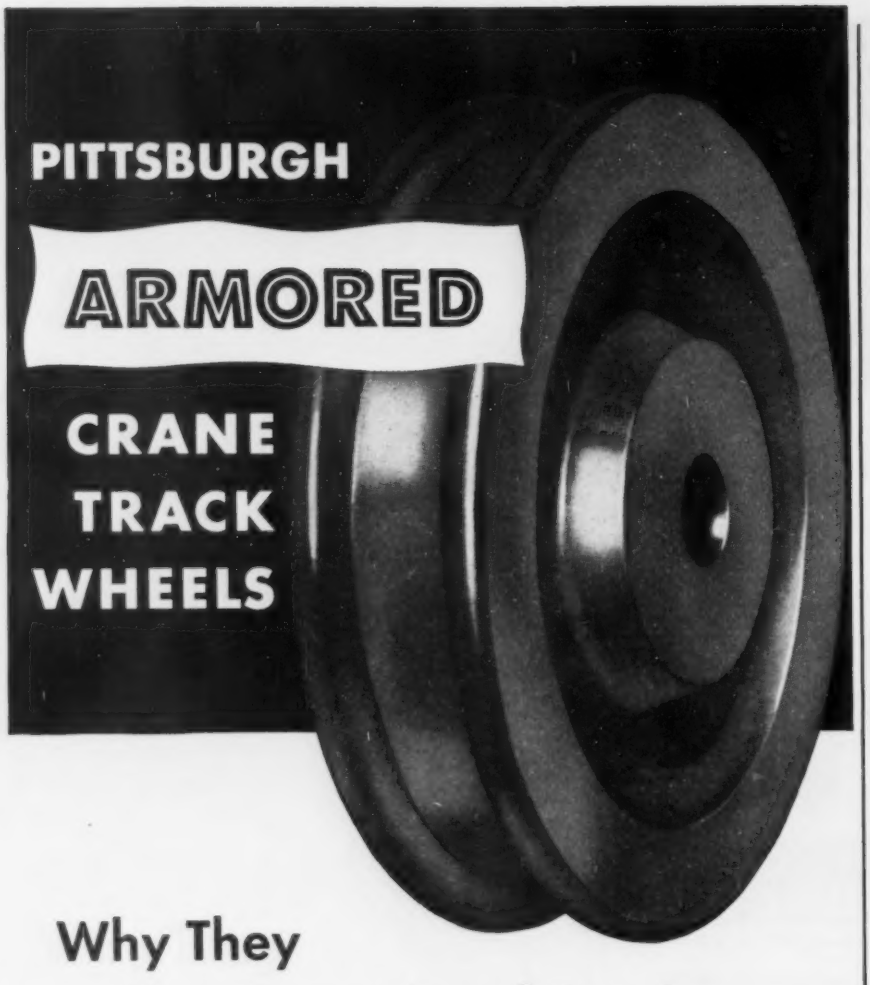

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• The secret of the long life of PITTSBURGH **Armored** Crane Wheels lies in something you can't see. It's part of the process perfected by PITTSBURGH which puts the right hardness in the right places. The treads and flanges are armored to the extra hardness of 601-712 B.H.N. 81-95 SC. But the cores? They are left tough and highly resistant to shock.

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—Ferroalloy Prices—

(Effective Aug. 4, 1953)

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$34.00
19 to 21%	3% max.	36.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	36.95
Ton lots	38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	31.50
Ton lots	32.50
Less ton lots	35.50 to 37.00
Premium for hydrogen-removed metal	1.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.00
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.40
Ton lots	13.05
Briquet contract basis carlots, bulk delivered, per lb of briquet	12.65
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	13.00
97% Si, 1% Fe	13.50

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.35
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
65% Si	13.60	90.95% Si	17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10-3.20
High speed steel (Primos)	3.20-3.25

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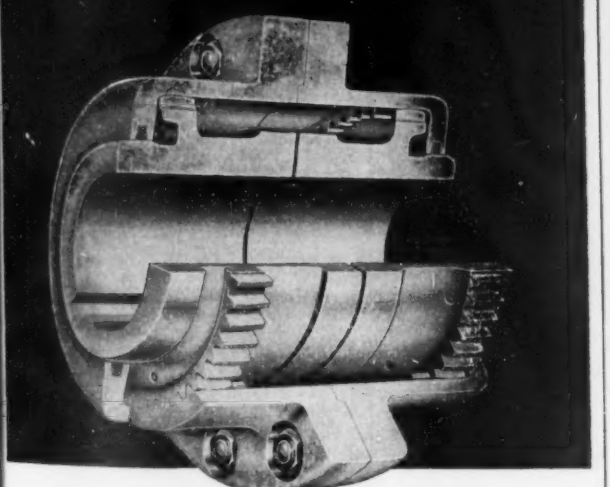

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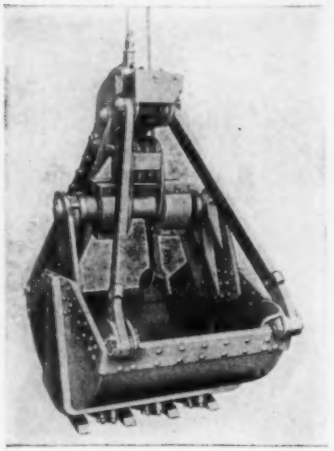

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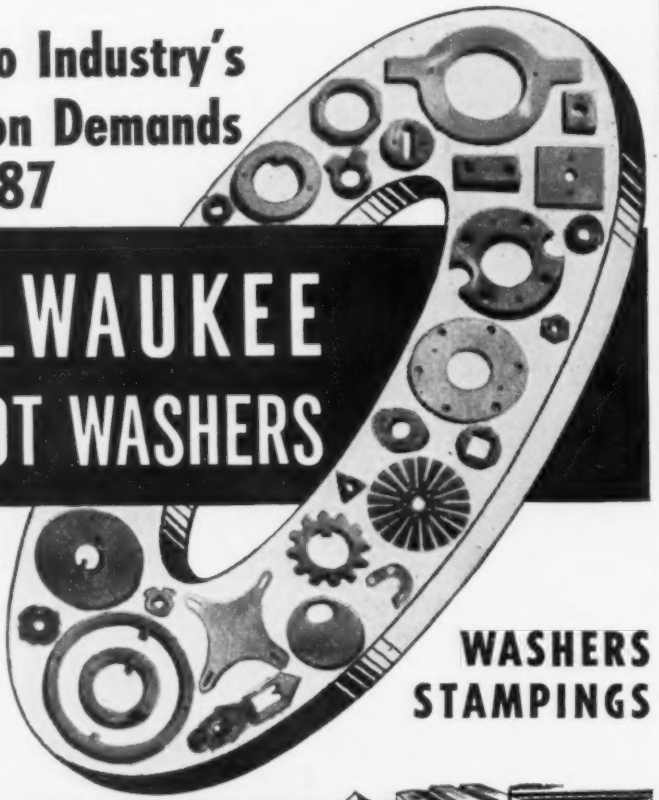

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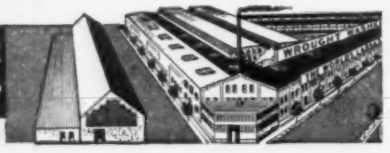

Ferroalloy Prices

(Effective Aug. 4, 1953)

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carloads ..... $ .80
Ton lots 11.30

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60% 2 in. x D contract basis, delivered per pound contained Cb.
Ton lots $6.40
Less ton lots 6.45

Ferro-Tantalum-Columbium, 20% Ta, 40% Cb, 0.30% C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $4.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32

Ferrophosphorus, electrolytic, 22-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload $75.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $4.45

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.12

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 16.50¢
Ton lots, bulk lump ..... 16.75¢
Less ton lots, lump ..... 16.35¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.21

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots $1.00

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B... $6.35

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound.... 50¢

Corbortam, Ti 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots.... $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B..... .85
14 to 16% B..... 1.30
19% min. B..... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 65¢
No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

Nickel - Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered
Less ton lots $2.05

Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

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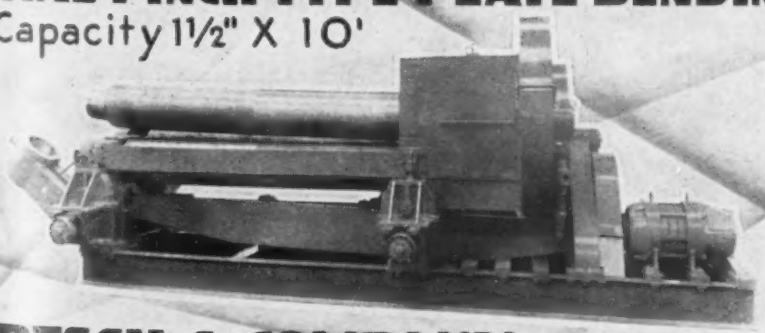

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60" x 20' NILES BEMENT POND Geared Head Engine Lathe, rapid traverse
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62" BULLARD Vertical Boring Mill, 2 swivel rail heads, power rapid traverse, AC-MD
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NEWS OF USED AND REBUILT MACHINERY

Hit Farm Market . . . Selling used machine tools in farm areas is hard on salesmen, but some West Coast machinery firms have found farm machinery maintenance firms a fairly good market.

One sale of this type made last week was to a man who wanted to open up a tractor and implement maintenance shop. He had production knowhow from many years of experience working for a tractor manufacturer but didn't have enough cash to buy the lathe he needed to start in business.

As a result, he was shopping the used machinery market. Moore Machinery Co., San Francisco, a large dealer in new and used equipment, offered him a prewar 19 in. x 8 ft lathe for $2750.

Although old, the lathe had been kept in good condition and was adequate for nonprecision work. Under standard financing practice the machine was delivered from stock for $550 down with the balance due in 24 months.

Cost Much More . . . Cost of a comparable new machine would have been $12,500 and there might have been a delay on delivery. With comparable financing, a downpayment of $2500 would have been required which would have put the lathe out of the prospective shopowner's reach.

In helping one-man shops get started, used machinery firms often find that leaning over backward to aid a small shop in the beginning pays off in the long run. Fred Kruse, Moore Machinery sales manager, points out that many of these farm shops prove highly successful, and that as work increases they buy more equipment, usually from the dealer who helped them get started.

Fewer Home Repairs . . . Reason for farm service shop growth is that farmers are doing more farming and less tinkering. Since their income has risen considerably in recent years, farmers' time has become increasingly valuable. Years ago they used to haul out baling wire and tinker for hours to get a machine going. Now they take it to an experienced repair shop.

Crane Market Fair . . . If the used and rebuilt crane business in Pittsburgh is any barometer, industrial activity during the next 6 months will be fair to good.

Used crane business generally is slow following a moderately good first half, but good cranes with ac motors are in strong demand though difficult to find. More dc cranes are available, but most of them are old.

While prices are holding, prospects are becoming more price-conscious and dealers are finding it difficult to clinch sales. An encouraging sign, however, is the steady flow of inquiries.

Dropped 25 Pct . . . One dealer reports business in first 6 months of the year was good, but doesn't compare with last year at this time when activity was especially brisk. He estimates January to June business was off 25 pct from 1952.

Increasing availability of new cranes in sizes up to 25 tons has had an adverse effect on used and rebuilt equipment in this category. However, manufacturers are said to be quoting 5 to 6-month delivery on these units.

Sale Misfired . . . An indication of the increasingly independent attitude of buyers is evident from a report by a Pittsburgh dealer who shipped two cranes to a dealer in another city. The second dealer was certain he had a buyer, but when the prospect inspected the cranes he turned them down.

Machine tool business apparently has hit a midsummer slump, although some equipment is moving. Dealers believe activity will be slow until September.

Activity in steel mill equipment, while fair, is not exceptionally strong. Electrical equipment business is still poor, and probably will remain so due to lack of interest on the part of steel producers and coal operators.